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CONFIGURATION SPECIFICATION FOR IMPROVED AH-1G/Q HELICOPTERS. R--ETC(U)
MAY 74 R A MCWILLIAMS DAAJ01-74-C-0403
UNCLASSIFIED BHT-209-947-200-REV-B NL

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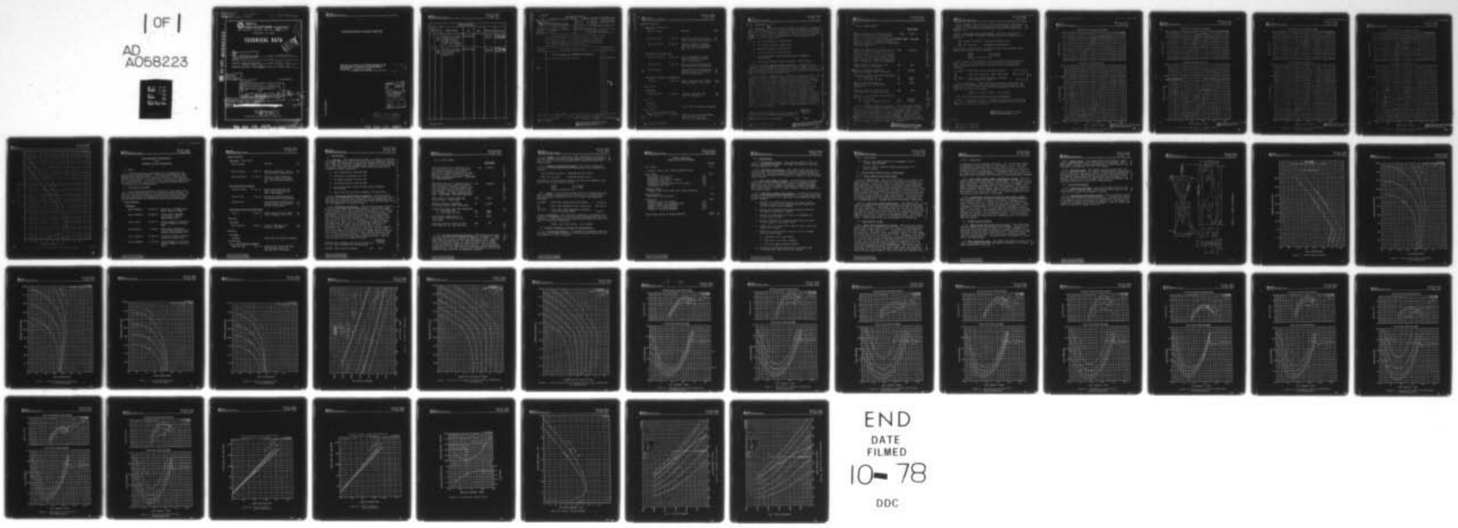

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FMC-12757

Maj. Richard Mettinger

BELL
HELICOPTER COMPANY
POST OFFICE BOX 482 · FORT WORTH, TEXAS 76101 A textron COMPANY

CODE IDENT NO. 97499

TECHNICAL DATA

LEVEL

10

BY R. A. McWilliams DATE 1 February 1974

CHECKED ________ DATE ________

APPROVED Paul G. Mantes DATE 7 Feb 74

APPROVED E. R. Nanaley DATE 7 FEB 74

12 48 p.

MODEL Improved AH-1G/Q NO. OF PAGES 35
ICAM Program

REPORT NO. 209-947-200 DATE 2-1-74

6 CONFIGURATION SPECIFICATION
FOR
IMPROVED AH-1G/Q HELICOPTERS. Revision B,

PREPARED UNDER CONTRACT DAAJ01-74-C-0403 15

14 BHT-209-947-200-REV-B [redacted]

Revision B
Date 11 16 May 1974

Supersedes Rev A dated 27 Feb 1974

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BELL
HELICOPTER COMPANY

PROPRIETARY RIGHTS NOTICE

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REVISIONS						
REV LTR	DATE	DESCRIPTION	BY	CKD.	APPROVED	APPROVED
A	27 Feb 1974	Revised to update performance and weight data to latest configuration (Re: figures 1, 4, 5, 6, and 7).	McWilliams		2-27-74	27 FEB 74
B	16 May 1974	Revised to update requirements for contractual submittal.	McWilliams		5-24-74	28 MAY 74

SPECIFICATION CHANGE NOTICE
(SEE MIL-STD-490 FOR INSTRUCTIONS)

DATE PREPARED 11-4-74

1. ORIGINATOR NAME AND ADDRESS	2.	3. CODE IDENT.	4. SPEC. NO.
BELL HELICOPTER COMPANY	☐ PROPOSED / ☒ APPROVED	97499	209-947-200B
		5. CODE IDENT. 97499	6. SCN NO. 1

7. SYSTEM DESIGNATION	8. RELATED ECP NO.	9. CONTRACT NO.	10. CONTRACTUAL ACTIVITY
IMPROVED AH-1G/Q	NONE	DAAJ01-74-C-0403	--

11. CONFIGURATION ITEM NOMENCLATURE	12. EFFECTIVITY
ICAM HELICOPTERS	AH-1G S/N 70-15936 AH-1Q S/N 70-16055

THIS NOTICE INFORMS RECIPIENTS THAT THE SPECIFICATION IDENTIFIED BY THE NUMBER (AND REVISION LETTER) SHOWN IN BLOCK 4 HAS BEEN CHANGED. THE PAGES CHANGED BY THIS SCN BEING THOSE FURNISHED HEREWITH AND CARRYING THE SAME DATE AS THIS SCN. THE PAGES OF THE PAGE NUMBERS AND DATES LISTED BELOW IN THE SUMMARY OF CHANGED PAGES, COMBINED WITH NON-LISTED PAGES OF THE ORIGINAL ISSUE OF THE REVISION SHOWN IN BLOCK 4, CONSTITUTE THE CURRENT VERSION OF THIS SPECIFICATION.

13. SCN NO.	14. PAGES CHANGED (INDICATE DELETIONS)	* S	* A	15. DATE
	PAGES CHANGED AND TRANSMITTED HEREWITH			
1	2, 3, 4, 5, 23, 24, 28, 29, 33	X		11-4-74

16. TECHNICAL CONCURRENCE — ICAM PROJECT ENGINEER — DATE 11-4-74

* "S" indicates supersedes earlier page. "A" indicates added page.

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SPECIFICATIONS

Military (Continued)

MIL-W-25140A		Deleted.	B
MIL-A-25463A	3 Feb 72	Adhesive, Metallic, Structural Sandwich Construction	B
MIL-C-25478(1)	14 Feb 57	Coolers, Lubricating Oil, Aircraft Engine, Synthetic Oil, General Specification for	

Bell Helicopter Company

209-947-105R-1	19 Jul 72	Detail Specification for Model AH-1G Helicopters, FY-71 Procurement	
209-947-150	7 Jan 74	Modification Specification for Model AH-1Q Helicopters	
209-947-199		Airworthiness Qualification Specification for Improved AH-1G/Q Helicopters	B

Lycoming Division of AVCO Corp.

104.43	1 May 74	Model Specification, Shaft Turbine Engine, T53-L-703	(1)

STANDARDS

Military

MIL-STD-210A	2 Aug 57	Climatic Extremes for Military Equipment	B

DRAWINGS

Military

AND 20005		Drive-Type XV Engine Accessory

PUBLICATIONS

U. S. Army Materiel Command

AMCP 706-203	Dec 71	Engineering Design Handbook, Helicopters, Part III Qualification Assurance

3. REQUIREMENTS

3.1 General. This specification shall be limited to defining only those components which are added and the subsequent resulting weight and performance changes for Improved AH-1G/Q helicopters. The basic primary changes shall consist of installing the following components and making modifications as required to accommodate these components:

a. main transmission, 212-040-TBA

b. GFE engine, Lycoming T53-L-703 B

c. 90-degree gearbox, 212-040-TBA

d. 42-degree gearbox, 212-040-TBA

e. tail rotor drive shaft bearing hanger assembly, 212-040-TBA

f. Tail rotor hub and blade assembly, 209-011-700-5

3.1.1 Transmission/powertrain guarantee. The powertrain described in paragraph 3.1, minus item b, the engine and item f, the tail rotor hub and blade assembly, shall be guaranteed to successfully complete the 200-hour bench test per the test schedule in paragraph 3.4 of 209-947-199. B

3.1.2 Estimated performance. Estimated performance shall be as follows for ICAO standard atmospheric conditions, unless otherwise specified, for a constant rotor speed of 324 RPM and a gross weight of 10,000 pounds unless otherwise stated. The aerodynamic drag configuration utilized in the performance estimations is based upon estimated drag variations of the XM65 TOW Missile System applied to "Engineering Phase D Test Results of the Bell AH-1G Huey Cobra, U. S. Army Aviation Test Activity, April 1970". Performance is based on power available and fuel flow from Lycoming Model Specification 104.43, dated 1 May 1974, covering the T53-L-703 Shaft Turbine Engines using JP-4 fuel. All performance items are with the GFAE particle separator and foreign object damage screen installed and without the environmental control system operating, and with the IR suppressor removed. Aircraft center of gravity shall be the most critical from a drag standpoint, and all weapons shall be in a stowed attitude. B A (1) A

		ESTIMATED
Maximum level flight speed at sea level at 1134 shp, 6600 RPM (4/8 TOW missiles)	kts	131/128
Maximum never exceed airspeed	kts	170

B

3.1.2 (Continued)

		ESTIMATED	
Maximum endurance at sea level with 1716 pounds of fuel. Fuel includes 10 percent reserve plus 2 minute warm-up and take-off allowance at (MCP). MAX CONT. POWER Does not include 5 percent increase in engine specification SFC. (6600 RPM) (4/8 TOW missiles)	hrs	2.6/2.5	B
Operating radius at cruising speed at sea level with 1716 pounds of fuel. Fuel includes 10 percent reserve plus 2 minute warm-up and take-off allowance at MCP. Does not include 5 percent increase in engine specification SFC. (6600 RPM) (4/8 TOW missiles)	nmi	135/131	B
Best rate of climb at 1290 shp at sea level. (6600 RPM)	fpm	1620	A
Service ceiling at Maximum Continuous Power (MCP) (6600 RPM)	ft	12,200	
Hovering ceiling, OGE (6600 RPM)(IPR)			A
a. with 95°F OAT	ft	1200	
b. with ICAO Std OAT	ft	3800	
Hover gross weight OGE at 4000 ft and 95°F OAT and IRP (6600 RPM)	lb	9050	
Vertical rate of climb with IRP (6600 RPM) at sea level/Std Day	fpm	320	A
Gross weight at 2000 ft and 70°F OAT and IRP (6600 RPM)			
a. Hover, OGE	lb	10,000	(1)
b. 300 fpm vertical rate of climb	lb	9730	B

3.1.3 Aircraft performance curves. The estimated aircraft performance curves are included on pages 12 through 35. Data are shown for a rotor speed of 324 RPM and for both clean and eight TOW configuration. The maximum mission gross weight shall include full ordnance, crew, and fuel, not to exceed an operating gross weight of 10,000 pounds. All performance curves are with the GFAE particle separator and foreign object damage screen installed, without the environmental control system operating, and with IR suppressor removed.

3.1.4 Weight. The contractor shall establish and maintain a suitable system to provide a high degree of weight and balance control and to facilitate preparation of specified weight and balance data. B

3.1.5 Center of gravity locations. The center of gravity limits for internal loading of the helicopter are estimated as follows:

Most forward cg limit = Fuselage Station 190.0

Most aft cg limit = Fuselage Station 201.0

In addition, the estimated lateral cg limits for external loading of the aircraft are as follows:

Right	2.5 inches
Left	2.5 inches
Taken at Waterline 70	

3.1.6 Areas. The principal areas which will change from the basic aircraft configuration are calculated to be as follows (the following information is not to be used for inspection purposes):

A. (Tail)	= Tail rotor blade area (one blade)	4.07 sq ft	(1)
A_g	= Tail rotor geometric disc area total	56.75 sq ft	
σ_g (Tail)	= Tail rotor blade geometric solidity ratio (area/disc area)	.144 sq ft	

3.1.7 Dimensions. The principal dimensions and general data which will change from the basic aircraft configuration are estimated to be as follows (the following information is not to be used for inspection purposes):

Chord, tail rotor blade 11.5 inches

3.2 General features of design and construction.

3.2.1 General arrangement. The general arrangement shall be the same as the basic AH-1G and AH-1Q helicopter, except for the improvements as defined herein.

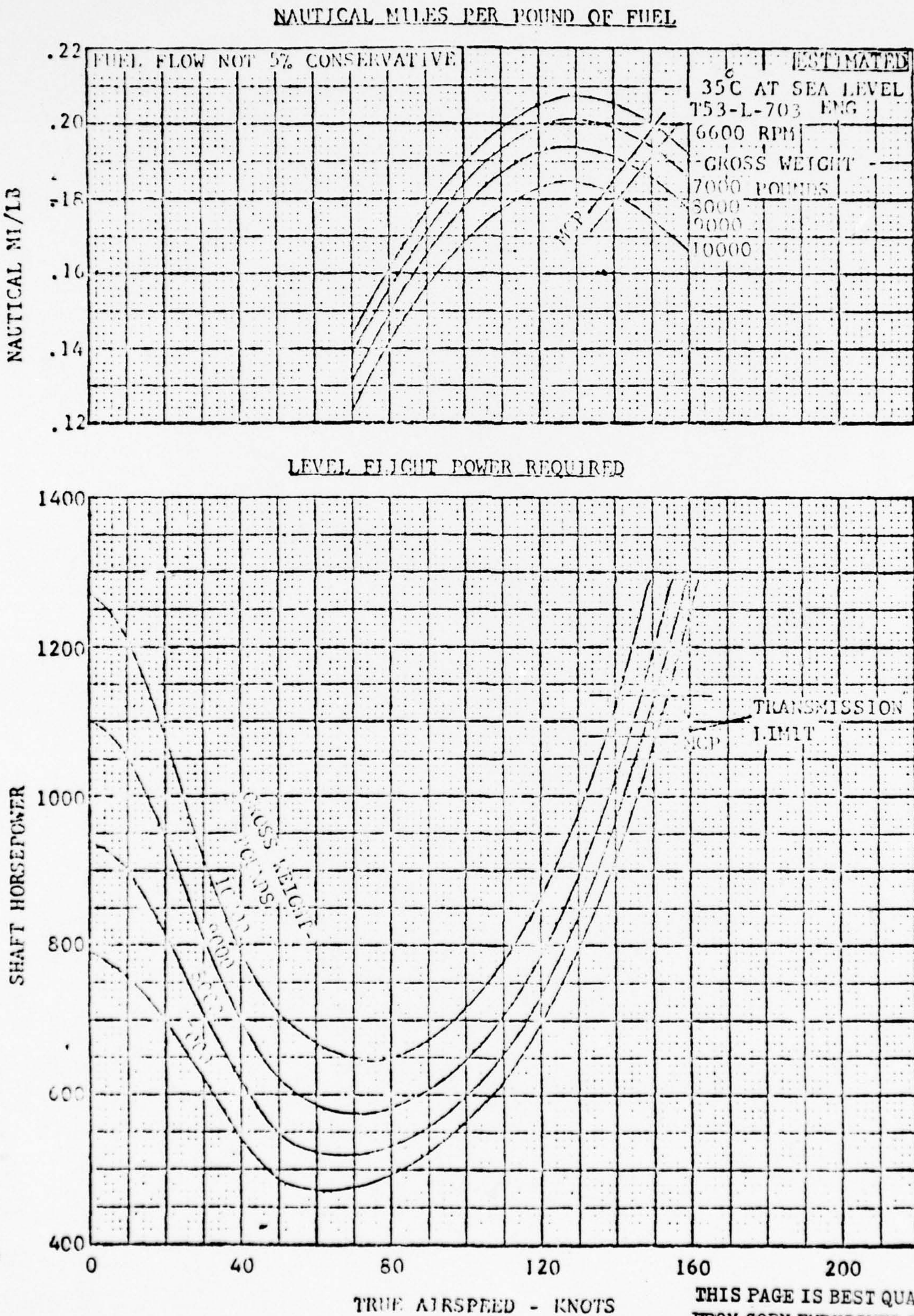


Figure 13. Performance at Sea Level 35° C, Clean Configuration

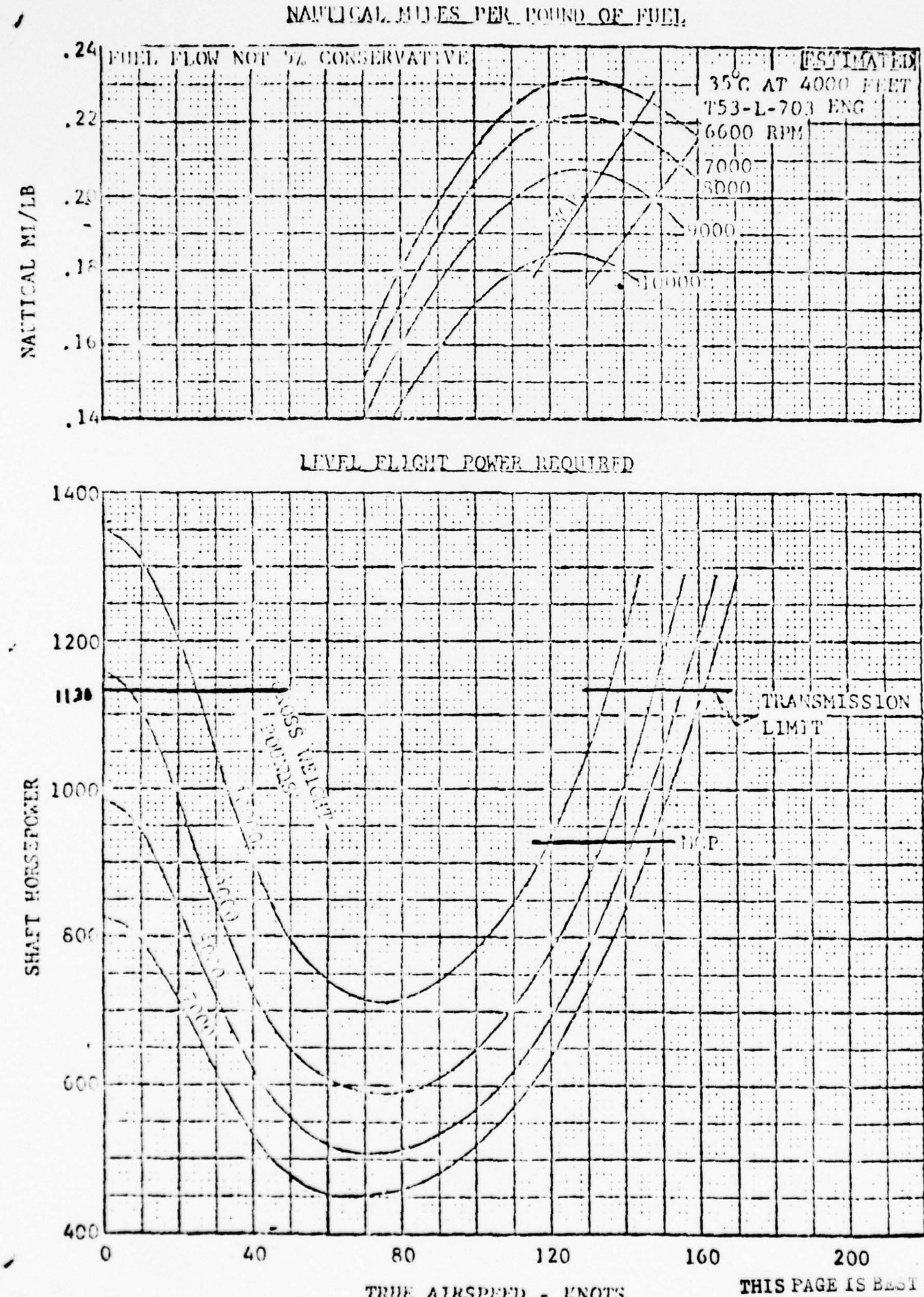
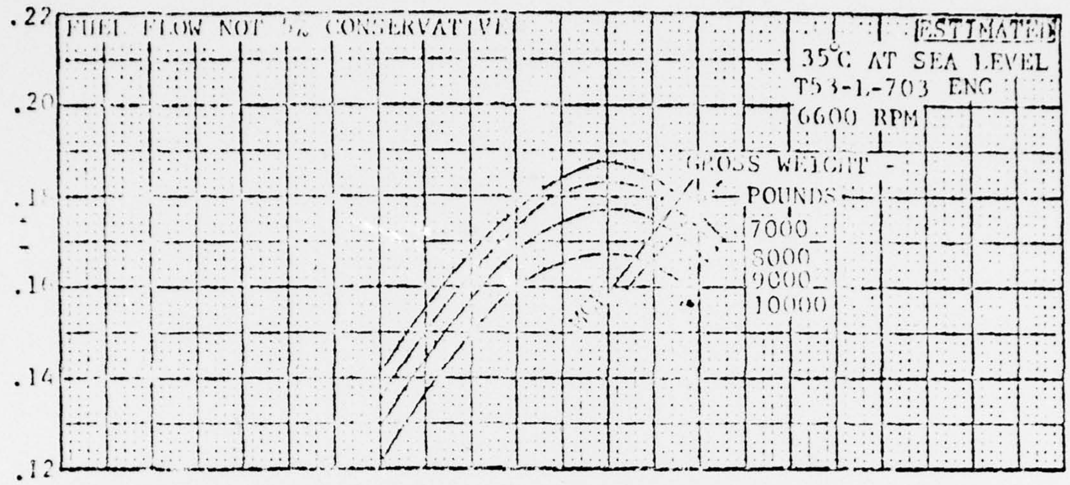


Figure 14. Performance at 4000 Feet 35° C, Clean Configuration.

NAUTICAL MILES PER POUND OF FUEL



LEVEL FLIGHT POWER REQUIRED

Figure 18. Performance at Sea Level 35° C, 8 Tow Configuration.

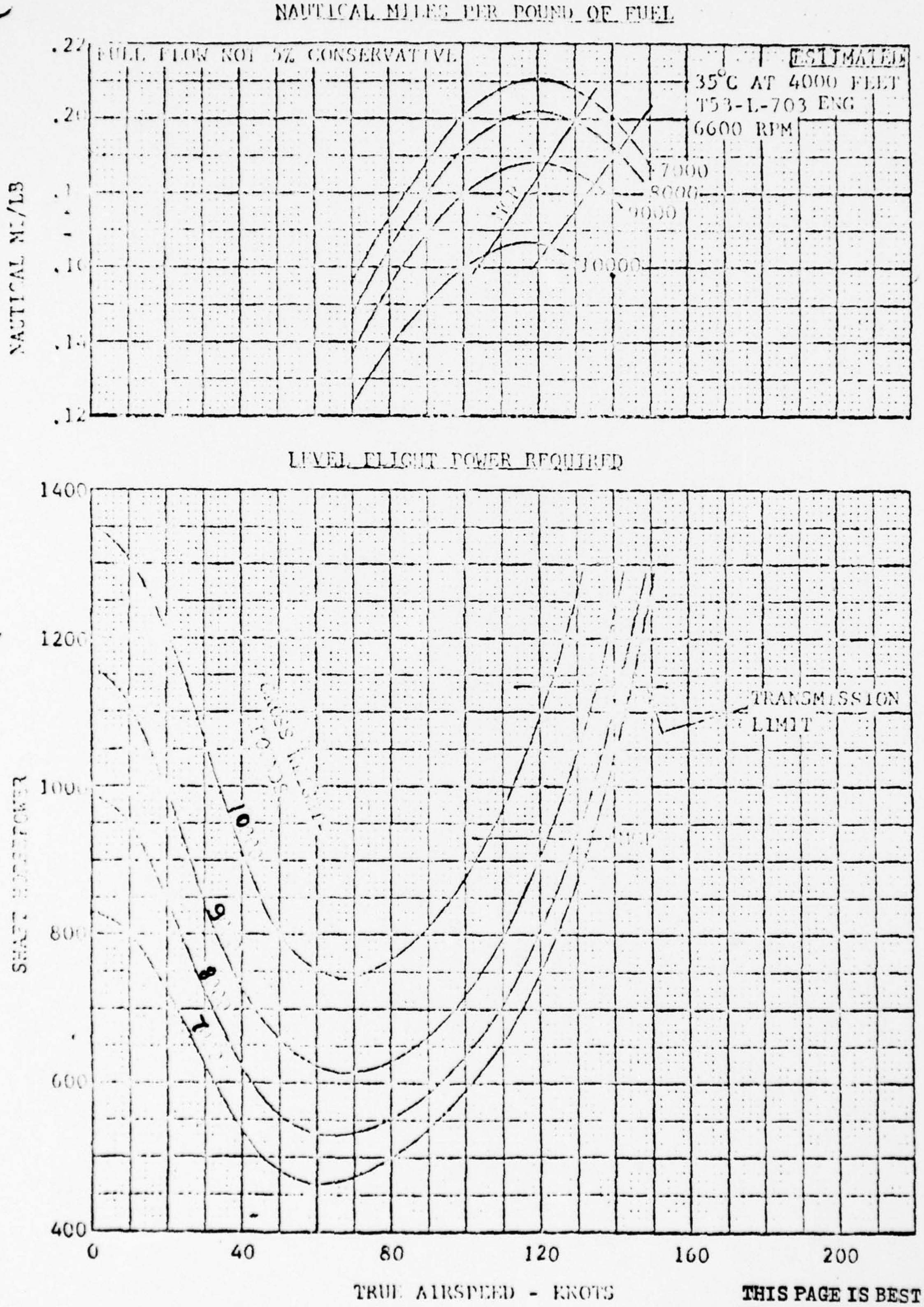


Figure 19. Performance at 4000 Feet 35° C, 8 Tow Configuration.

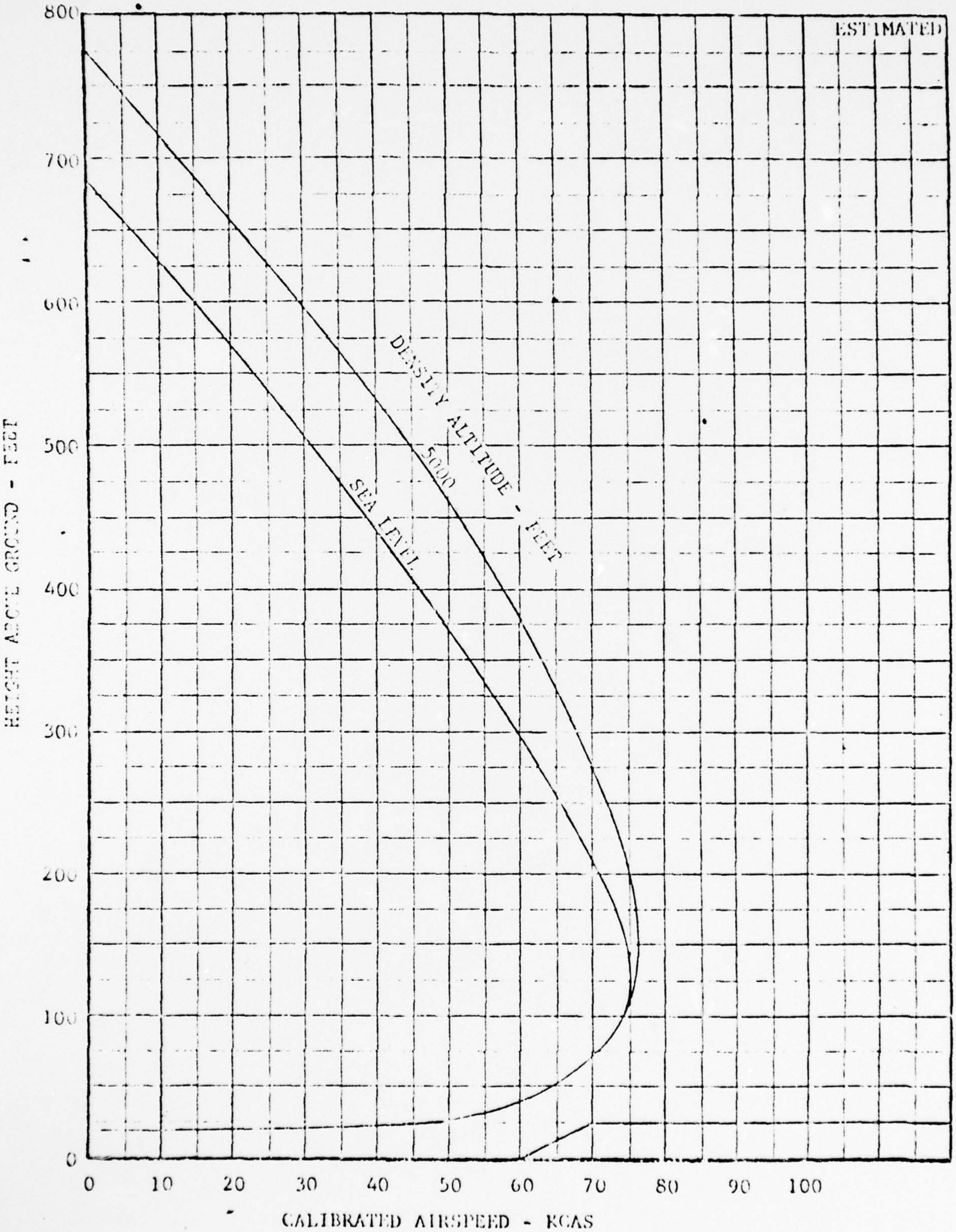


Figure 23. Height - Velocity Diagram: 10,000 Pounds G.W. (1)

CONFIGURATION SPECIFICATION
FOR
IMPROVED AH-1G/Q HELICOPTERS

1. SCOPE

1.1 This specification establishes the configuration of Improved AH-1G/Q Helicopters. Bell Helicopter Company (BHC) Specification 209-947-105R-1 is utilized as the baseline for defining the modifications required to arrive at the Improved AH-1G configuration. In addition, BHC Specification 209-947-150 is utilized as the baseline for defining the modifications for the Improved AH-1Q configuration.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the exact issue shown form a part of this specification to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this specification, the contents of this specification shall be considered a superseding requirement.

SPECIFICATIONS

Military

MIL-A-5090B(1)	15 Mar 55	Adhesives; Airframe Structural, Metal to Metal
MIL-T-5955A(1)	16 Aug 57	Transmission Systems, Helicopter, General Requirements for
MIL-L-7808G	22 Dec 67	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-H-8501A	7 Sep 61	Helicopter Flying and Ground Handling Qualities, General Requirements for
MIL-S-8698(1)	28 Feb 58	Structural Design Requirements for Helicopters
MIL-L-23699A	4 Feb 66	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base

SPECIFICATIONS

Military (Continued)

MIL-W-25140A		Deleted.	B
MIL-A-25463A	3 Feb 72	Adhesive, Metallic, Structural Sandwich Construction	B
MIL-C-25478(1)	14 Feb 57	Coolers, Lubricating Oil, Aircraft Engine, Synthetic Oil, General Specification for	

Bell Helicopter Company

209-947-105R-1	19 Jul 72	Detail Specification for Model AH-1G Helicopters, FY-71 Procurement	
209-947-150	7 Jan 74	Modification Specification for Model AH-1Q Helicopters	
209-947-199		Airworthiness Qualification Specification for Improved AH-1G/Q Helicopters	B

Lycoming Division of AVCO Corp.

104.43	1 Sep 73 1 MAR 74	Model Specification, Shaft Turbine Engine, T53-L-703	A

STANDARDS

Military

MIL-STD-210A	2 Aug 57	Climatic Extremes for Military Equipment	B

DRAWINGS

Military

AND2005		Drive-Type XV Engine Accessory

PUBLICATIONS

U. S. Army Materiel Command

AMCP 706-203	Dec 71	Engineering Design Handbook, Helicopters, Part III Qualification Assurance

3. REQUIREMENTS

3.1 General. This specification shall be limited to defining only those components which are added and the subsequent resulting weight and performance changes for Improved AH-1G/Q helicopters. The basic primary changes shall consist of installing the following components and making modifications as required to accommodate these components:

a. main transmission, 212-040-TBA

b. GFE engine, Lycoming T53-L-703 B

c. 90-degree gearbox, 212-040-TBA

d. 42-degree gearbox, 212-040-TBA

e. tail rotor drive shaft bearing hanger assembly, 212-040-TBA

f. Tail rotor hub and blade assembly, 209-011-700-5

3.1.1 Transmission/powertrain guarantee. The powertrain described in paragraph 3.1, minus item b, the engine and item f, the tail rotor hub and blade assembly, shall be guaranteed to successfully complete the 200-hour bench test per the test schedule in paragraph 3.4 of 209-947-199. B

3.1.2 Estimated performance. Estimated performance shall be as follows for ICAO standard atmospheric conditions, unless otherwise specified, for a constant rotor speed of 324 RPM and a gross weight of 10,000 pounds unless otherwise stated. The aerodynamic drag configuration utilized in the performance estimations is based upon estimated drag variations of the XM65 TOW Missile System applied to "Engineering Phase D Test Results of the Bell AH-1G Huey Cobra, U. S. Army Aviation Test Activity, April 1970". Performance is based on power available and fuel flow from Lycoming Card Deck File No. LS19.05.32.01 and Model Specification 104.43, dated 1 September 1973, covering the T53-L-703 Shaft Turbine Engines using JP-4 fuel. All performance items are with the GFAE particle separator and foreign object damage screen installed and without the environmental control system operating, and with the IR suppressor removed. Aircraft center of gravity shall be the most critical from a drag standpoint, and all weapons shall be in a stowed attitude. B A

		ESTIMATED	
Maximum level flight speed at sea level at 1134 shp, 6600 RPM (4/8 TOW missiles)	kts	131/128	B
Maximum never exceed airspeed	kts	170	

3.1.2 (Continued)

		ESTIMATED	
Maximum endurance at sea level with 1716 pounds of fuel. Fuel includes 10 percent reserve plus 2 minute warm-up and take-off allowance at MCP. Does not include 5 percent increase in engine specification SFC. (6600 RPM) (4/8 TOW missiles)	hrs	2.6/2.5	B
Operating radius at cruising speed at sea level with 1716 pounds of fuel. Fuel includes 10 percent reserve plus 2 minute warm-up and take-off allowance at MCP. Does not include 5 percent increase in engine specification SFC. (6600 RPM) (4/8 TOW missiles)	nmi	135/131	B
Best rate of climb at 1290 shp at sea level. (6600 RPM)	fpm	1620	A
Service ceiling at Maximum Continuous Power (MCP) (6600 RPM)	ft	12,200	
Hovering ceiling, OGE (6600 RPM)(IPR)			A
a. with 95°F OAT	ft	1200	
b. with ICAO Std OAT	ft	3800	
Hover gross weight OGE at 4000 ft and 95°F OAT and IRP (6600 RPM)	lb	9050	
Vertical rate of climb with IRP (6600 RPM) at sea level/Std Day	fpm	320	A

3.1.3 Aircraft performance curves. The estimated aircraft performance curves are included on pages 12 through 35. Data are shown for a rotor speed of 324 RPM and for both clean and eight TOW configuration. The maximum mission gross weight shall include full ordnance, crew, and fuel, not to exceed an operating gross weight of 10,000 pounds. All performance curves are with the GFAE particle separator and foreign object damage screen installed, without the environmental control system operating, and with IR suppressor removed. B

3.1.4 Weight. The contractor shall establish and maintain a suitable system to provide a high degree of weight and balance control and to facilitate preparation of specified weight and balance data. B

3.1.5 Center of gravity locations. The center of gravity limits for internal loading of the helicopter are estimated as follows:

Most forward cg limit = Fuselage Station 190.0

Most aft cg limit = Fuselage Station 201.0

In addition, the estimated lateral cg limits for external loading of the aircraft are as follows:

Right	2.5 inches
Left	2.5 inches
Taken at Waterline 70	

3.1.6 Areas. The principal areas which will change from the basic aircraft configuration are calculated to be as follows (the following information is not to be used for inspection purposes):

A_b (Tail)	= Tail rotor blade area (one blade)	4.3 sq ft
A_g	= Tail rotor geometric disc area total	60.0 sq ft
σ_g (Tail)	= Tail rotor blade geometric solidity ratio (area/disc area)	0.0717

3.1.7 Dimensions. The principal dimensions and general data which will change from the basic aircraft configuration are estimated to be as follows (the following information is not to be used for inspection purposes):

Chord, tail rotor blade 11.5 inches

3.2 General features of design and construction.

3.2.1 General arrangement. The general arrangement shall be the same as the basic AH-1G and AH-1Q helicopter, except for the improvements as defined herein.

Weight Statement
Improved AH-1G/Q Changes

		Pounds
Tail Group		1.2
Change to AH-1J tail rotor blades and hub		
Body Group		20.5
Strengthen vertical fin	3.0	
Strengthen tail boom	5.0	
Strengthen transmission support	6.0	
Strengthen lift beam	4.0	
Strengthen diagonal strut end fittings	2.0	
Strengthen lift link	.5	
Controls Group		1.6
Change to AH-1J push-pull tail rotor controls		
Engine Section		2.0
Strengthen engine mounts		
Propulsion		35.2
Change to T53-L-703 engine	5.0	
Enlarge engine oil cooling system	5.0	
Change to main transmission	11.6	
Change to 42-degree gearbox	2.6	
Change to 90-degree gearbox	11.0	
Total empty weight increase (pounds)		60.5

B

3.3 Aerodynamics.

3.3.1 Aerodynamic design. The fuselage exterior shall be smooth, featuring fairness of surfaces, trueness of contours, and minimization of drag.

3.3.2 Stability and control. MIL-H-8501 shall be used as a design guide for the stability and control characteristics of the aircraft. BHC Specification 209-947-199 shall be used for verifying the proposed modification with regard to airworthiness qualification.

3.4 Structural design criteria. The helicopter structural modification and component design shall be analyzed, flight qualified, and static tested to determine adequate margins resulting from the increased transmission torque, increased tail rotor thrust, increased engine weight, and associated control system loads.

3.4.1 Structural design improvements. In addition to installation of new components as defined in 3.1, the following types of modifications shall be accomplished to accommodate these component changes:

a. Install new modified push-pull tail rotor control system to adapt to the existing forward section of the tail rotor control system.

b. Modify the existing transmission support area for increased transmission torque.

c. Modify the existing lift beam to accommodate increased gross weight.

d. Replace airframe fittings and associated rod ends of the diagonal structural tube.

e. Design new lift link if the current AH-1J lift link cannot be utilized.

f. Modify existing tailboom vertical fin to accommodate the following:

   1. Increased tail rotor thrust

   2. Push-pull tail rotor controls

   3. AH-1J 90-degree gearbox support

g. Modify the existing tailboom to accommodate the increased tail rotor thrust and torque.

3.4.1 (Continued)

h. Install new engine mounts to accommodate the increased engine weight.

i. Install higher capacity engine/transmission oil cooler blower.

3.5 Anti-torque (tail) rotor or tail group.

3.5.1 Anti-torque (tail) rotor group.

3.5.1.1 Description. The tail rotor shall be a tractor type two-bladed, rigid, delta-hinged type employing preconing and underslinging. Each blade shall be connected to a common flex-beam type yoke by means of teflon-lined pitch-change bearings. The blade and yoke assembly shall be mounted on the tail rotor shaft by means of a delta-hinged trunnion to minimize rotor flapping. Teflon-lined bearings shall be used in the trunnion. A pitch-change mechanism shall be provided to increase or decrease the pitch of the blades. A dust boot shall be incorporated on the pitch-change mechanism where practicable. Provisions shall be incorporated for quick removal of one tail rotor blade for air transportability. Blades shall be individually serialized.

3.5.1.2 Tail rotor blade construction. The blades shall be of bonded aluminum alloy construction with a stainless steel spar used for rigidity. A honeycomb core shall be used to stabilize the shell structure. The blades shall be constant in plan form, and tapered in thickness from root to tip. The blades shall be suitably reinforced at the root end for attachment purposes and balanced to ensure individual interchangeability. The blades shall be bonded with adhesive conforming to MIL-A-5090 or MIL-A-25463. These blades shall not incorporate ice protection. B

3.6 Transmission system.

3.6.1 Main rotor transmission system. The main rotor transmission shall be in general accordance with the requirements of MIL-T-5955, except that it shall be capable of operating with MIL-L-7808 or MIL-L-23699 oil. A scupper drain line shall not be installed. The main rotor transmission shall be a two-stage planetary system with a bevel gear input. The gear ratio between the engine and rotor is 20.383 to 1. The transmission shall include parts used in the transmission of power to the main rotor through the mast assembly. The mast shall be constructed of tubular alloy steel and shall be readily removable from the transmission to facilitate disassembly for maintenance in the field and packaging of spare transmission. The transmission rating for Maximum Continuous Power (MCP) shall be 1134 shp at 6600 RPM with a 30-minute rating of 1290 shp at 6600 RPM for hover and low speed flights. Anti-friction type bearings shall B

3.6.1 (Continued)

be installed at all required locations. The transmission shall be mounted on suitable vibration isolators. A lift link shall be attached to the structure to carry thrust loads. The oil pressure transmitter and oil temperature sensing bulbs shall be installed on the transmission. A tachometer generator drive in accordance with Drawing AND20005, Type XVB, shall be provided for the main rotor and shall be installed on the transmission assembly.

3.6.2 Anti-torque (tail) rotor transmission system. The anti-torque (tail) rotor transmission system shall be compatible with oils conforming to MIL-L-7808 or MIL-L-23699. The system includes shaft assemblies, bearing hanger assemblies with flexible couplings, intermediate gearbox and tail rotor gearbox. The intermediate gearbox shall transmit power from the tailboom shafts to the rear shaft. The 90-degree gearbox transmits power from the rear shaft to the tail rotor shaft. All shaft assemblies shall incorporate quick-disconnect couplings.

3.6.3 Transmission system cooling and lubrication system. The transmission has a wet-sump lubrication system consisting of a pressure pump, oil cooler, an automatic emergency oil cooler bypass system, a pressure relief valve and bypass manifold, oil filters, jets, valves and associated hardware. These components are integral to the transmission assembly, except for the oil cooler. The oil pump shall be immersed in the oil sump. A temperature and pressure relief valve shall be integral with the oil cooler. The transmission shall include a 30-micron maximum oil filter with replaceable element. The transmission shall be cooled by conduction and supplemented by the transmission oil cooler.

3.7 Flight control system.

3.7.1 Directional tail rotor pitch control. The directional controls shall control tail-rotor pitch change. The tail-rotor pitch-control system shall consist of adjustable pedals and push-pull tubes and shall incorporate a single hydraulic system and pedal centering force gradient device. Duplicate tail rotor controls are not provided. The pilot's and gunner's pedals shall be interconnected. The system shall be designed in accordance with MIL-S-8698.

3.8 Main propulsion unit. The engine installation shall consist of one Model T53-L-703 GFE engine conforming to Lycoming Model Specification 104.43. B

3.8.1 Engine mount. The engine shall be mounted in a horizontal position above the aft portion of the fuselage. The mount shall consist of built-up steel and titanium members and fittings to accommodate the T53-L-703 engine. B

3.8.2 Cooling system. The engine cooling system shall prevent the temperatures of the engine, engine-mounted accessories, engine components, equipment located in the engine compartment, and engine fluids from exceeding the maximum allowable limits, provided the atmospheric air temperature does not exceed 12 °F (design objective of 22 °F) warmer than the hot atmospheric temperatures specified in Table III of MIL-STD-210. B

3.9 Lubricating system.

3.9.1 Piping and fittings. AN or MS fittings shall be used in the system. Tapered pipe threads shall not be used in the installation except for permanent closures. B

3.9.2 Temperature and surge control. An oil cooler in accordance with MIL-C-25478 shall be provided. A temperature control and pressure relief valve shall be provided for the oil cooler. A cooling fan shall be provided to supply air to the engine oil cooler to accommodate the T53-L-703 engine. The oil cooler fan shall be powered by engine bleed air.

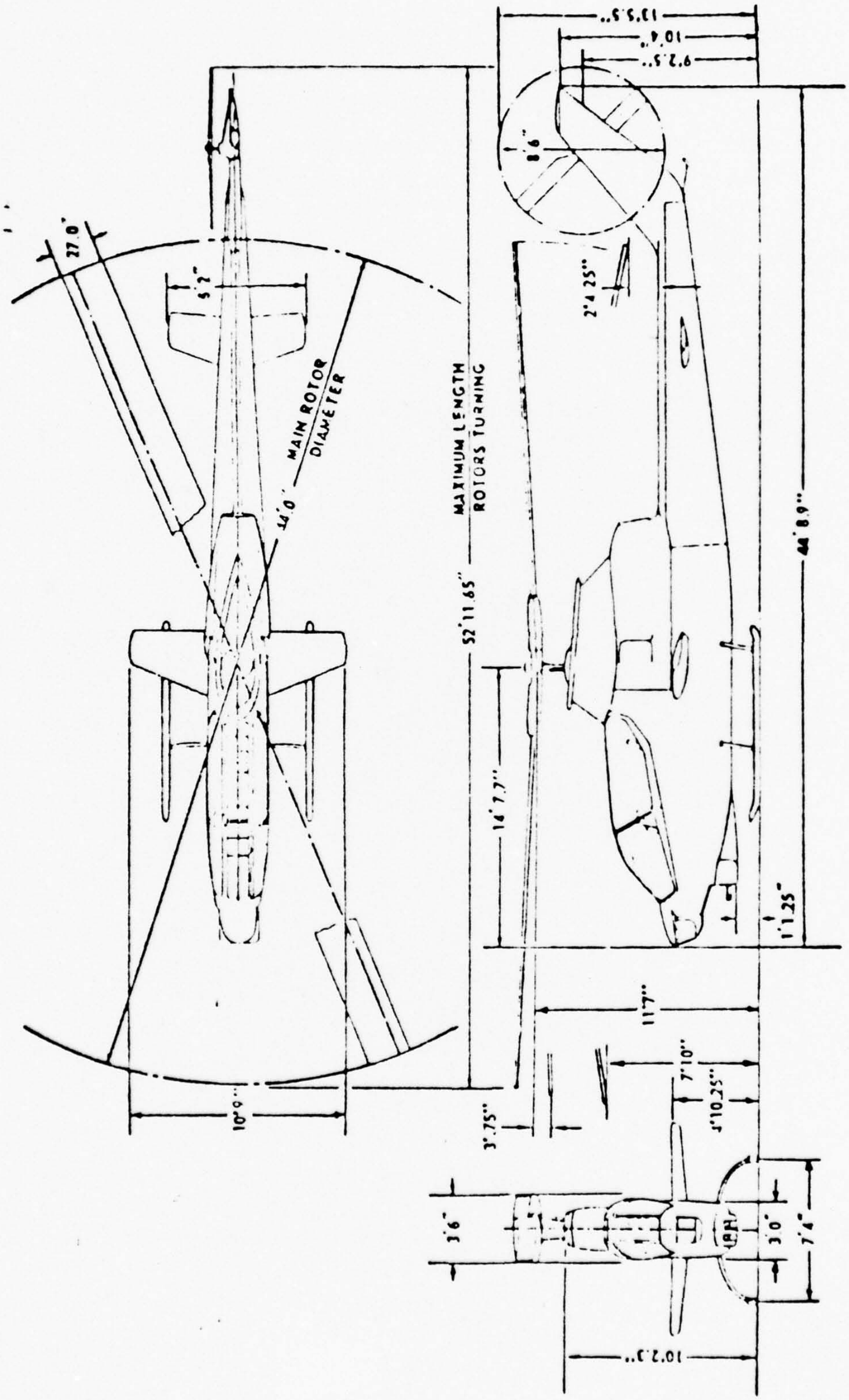


Figure 1. Three View Drawing

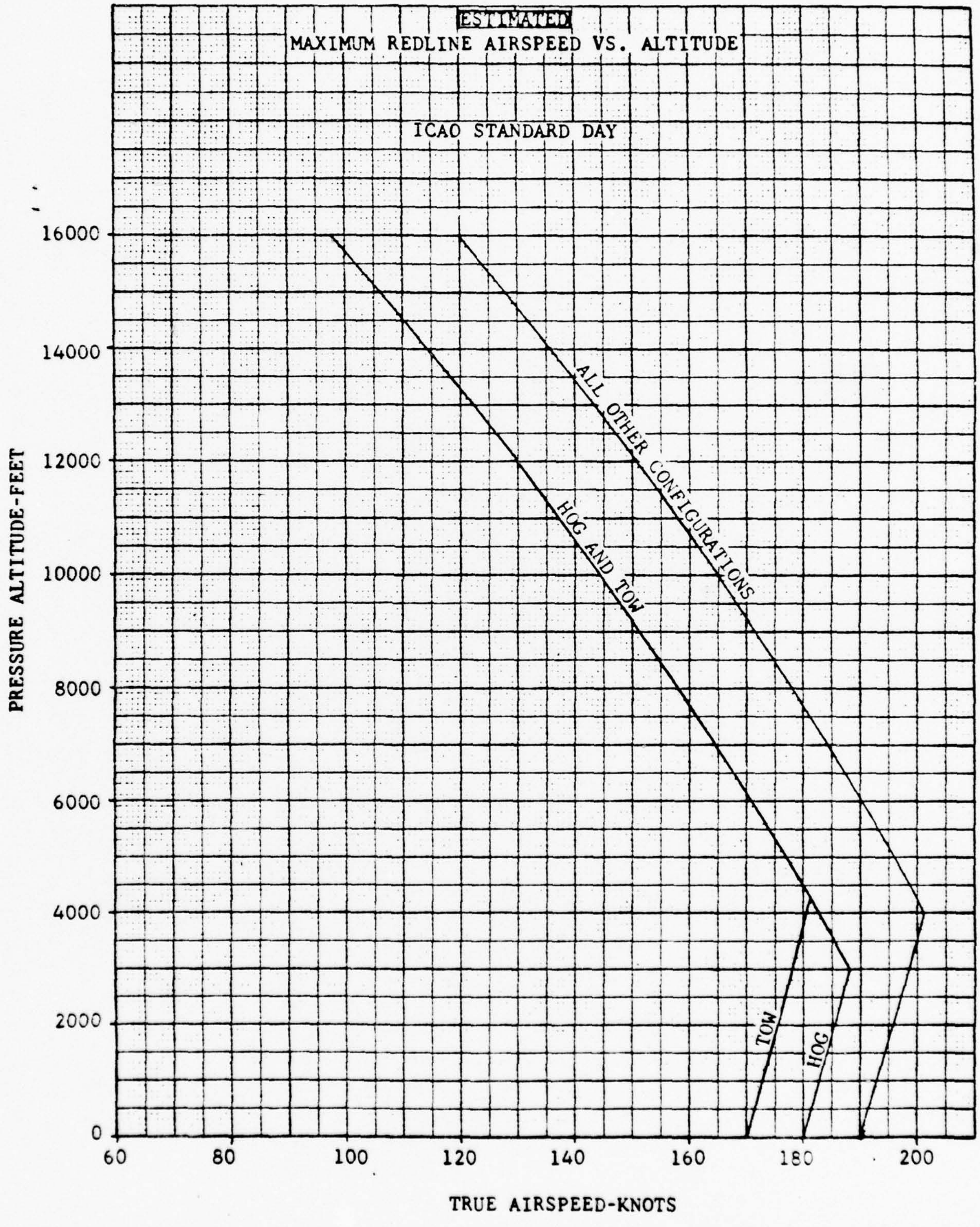


Figure 2 . Maximum Redline Airspeed

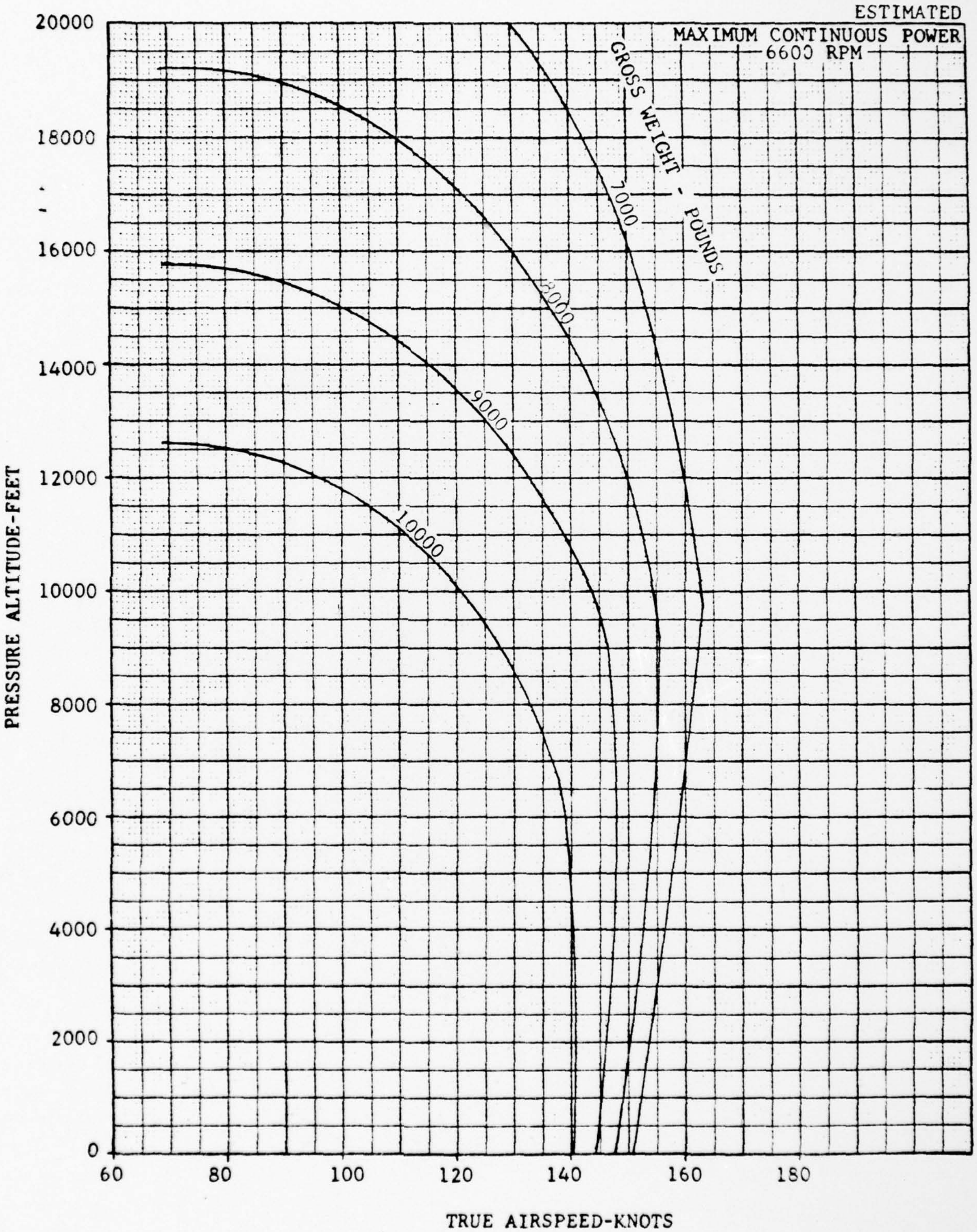


Figure 3 . Power Limited Speed, Standard Day Clean Configuration

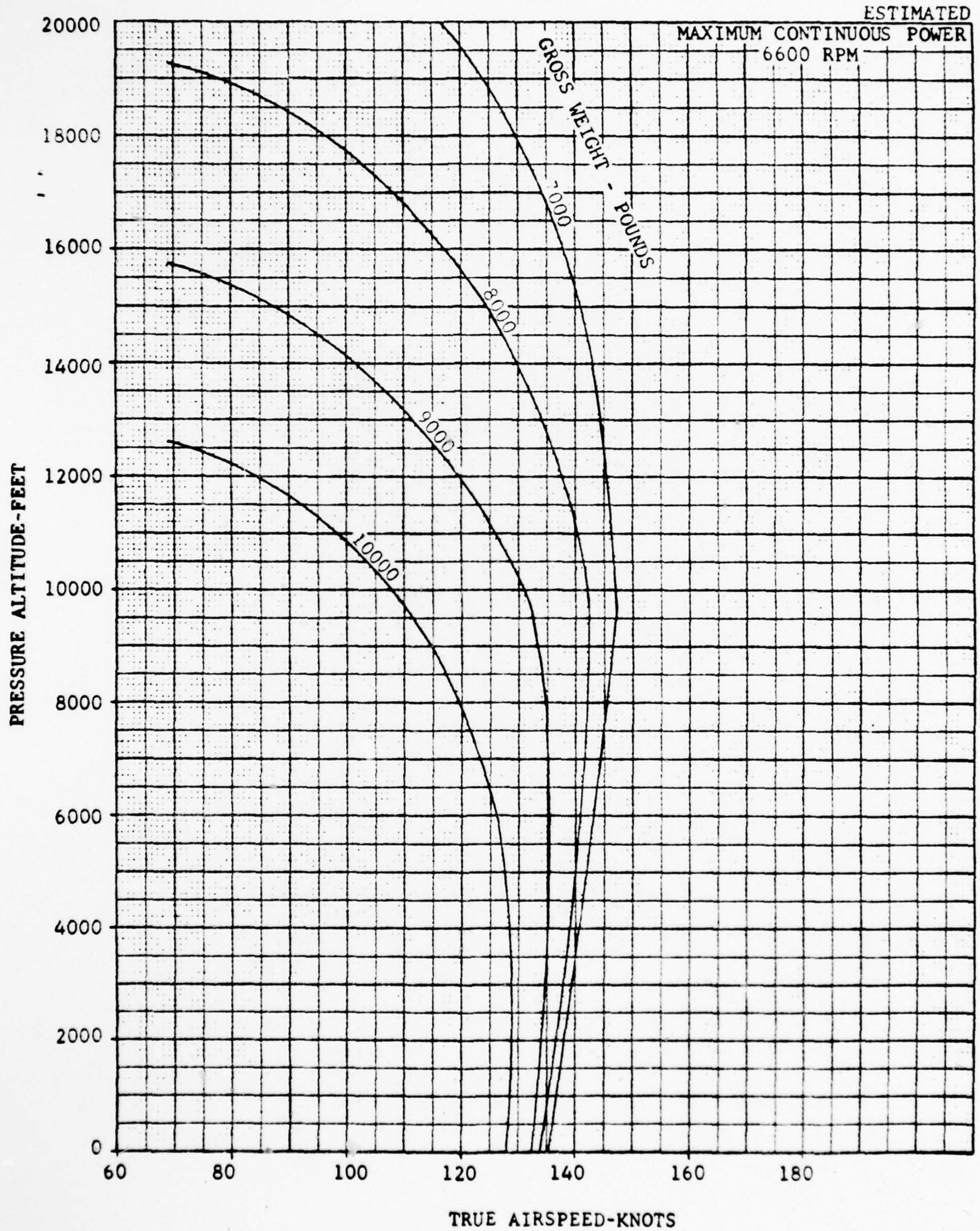


Figure 4 . Power Limited Speed, Standard Day
8 Tow Configuration

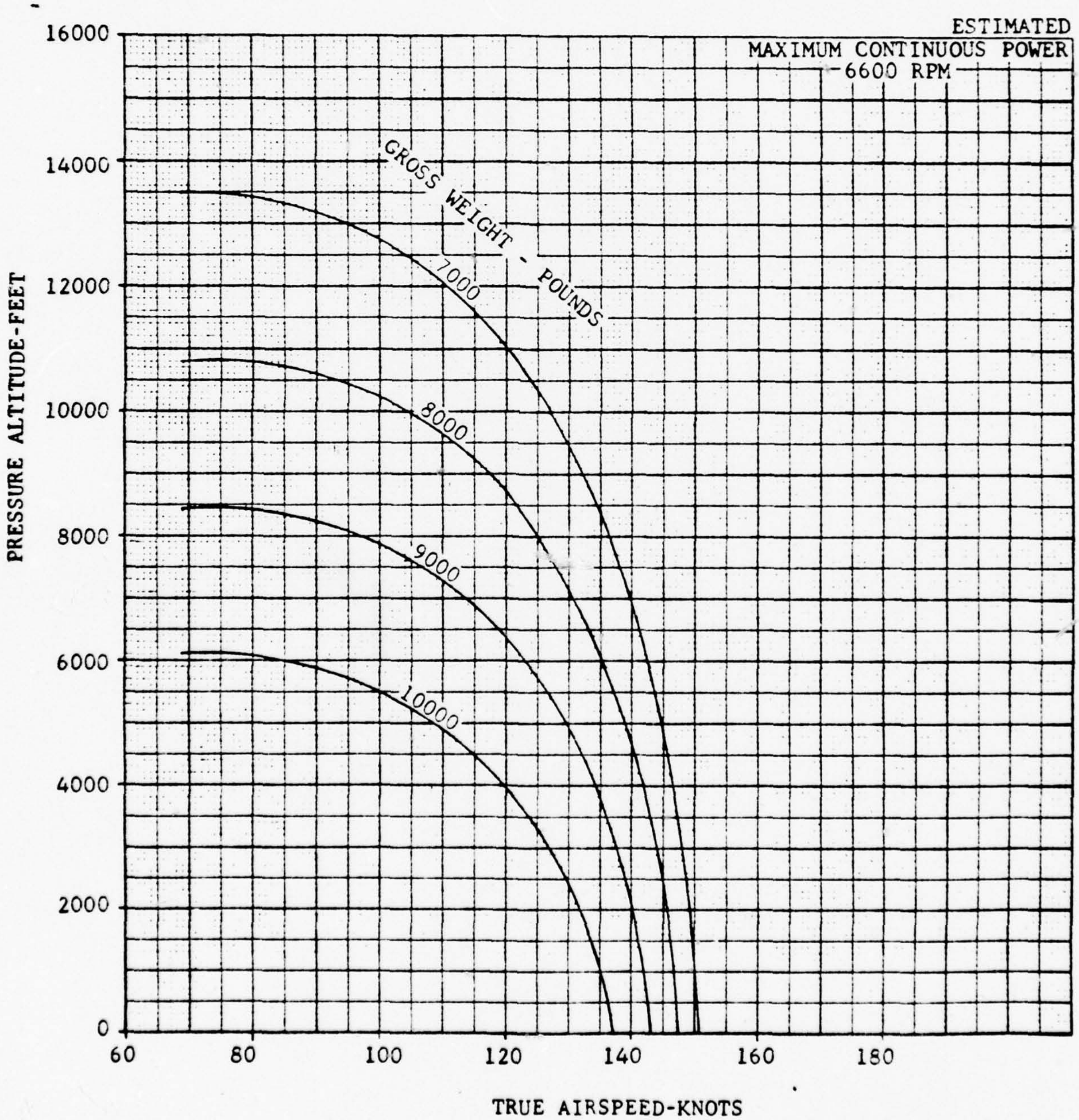


Figure 5 . Power Limited Speed, 35°C
Clean Configuration

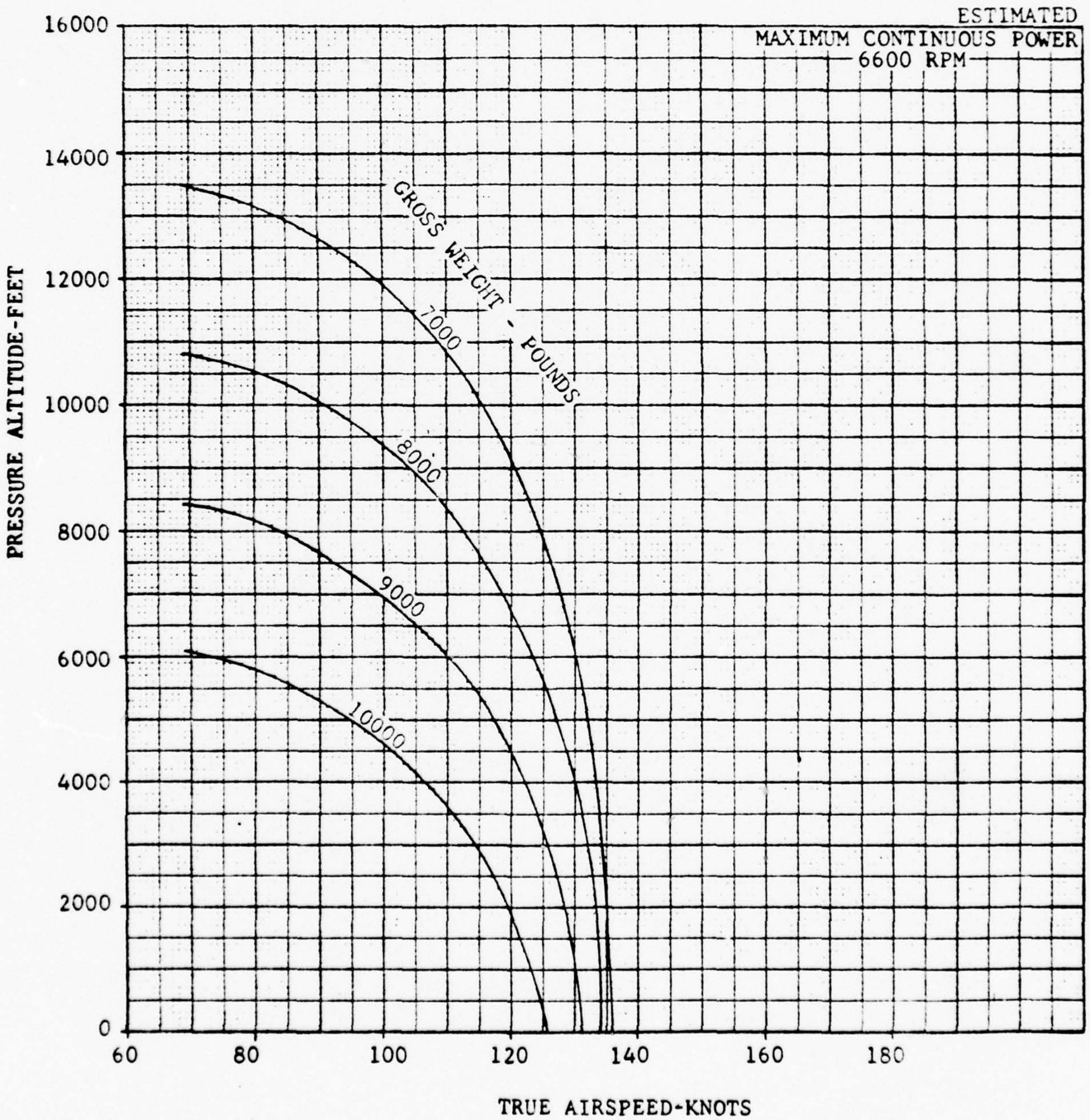


Figure 6 . Power Limited Speed, 35°C
8 Tow Configuration

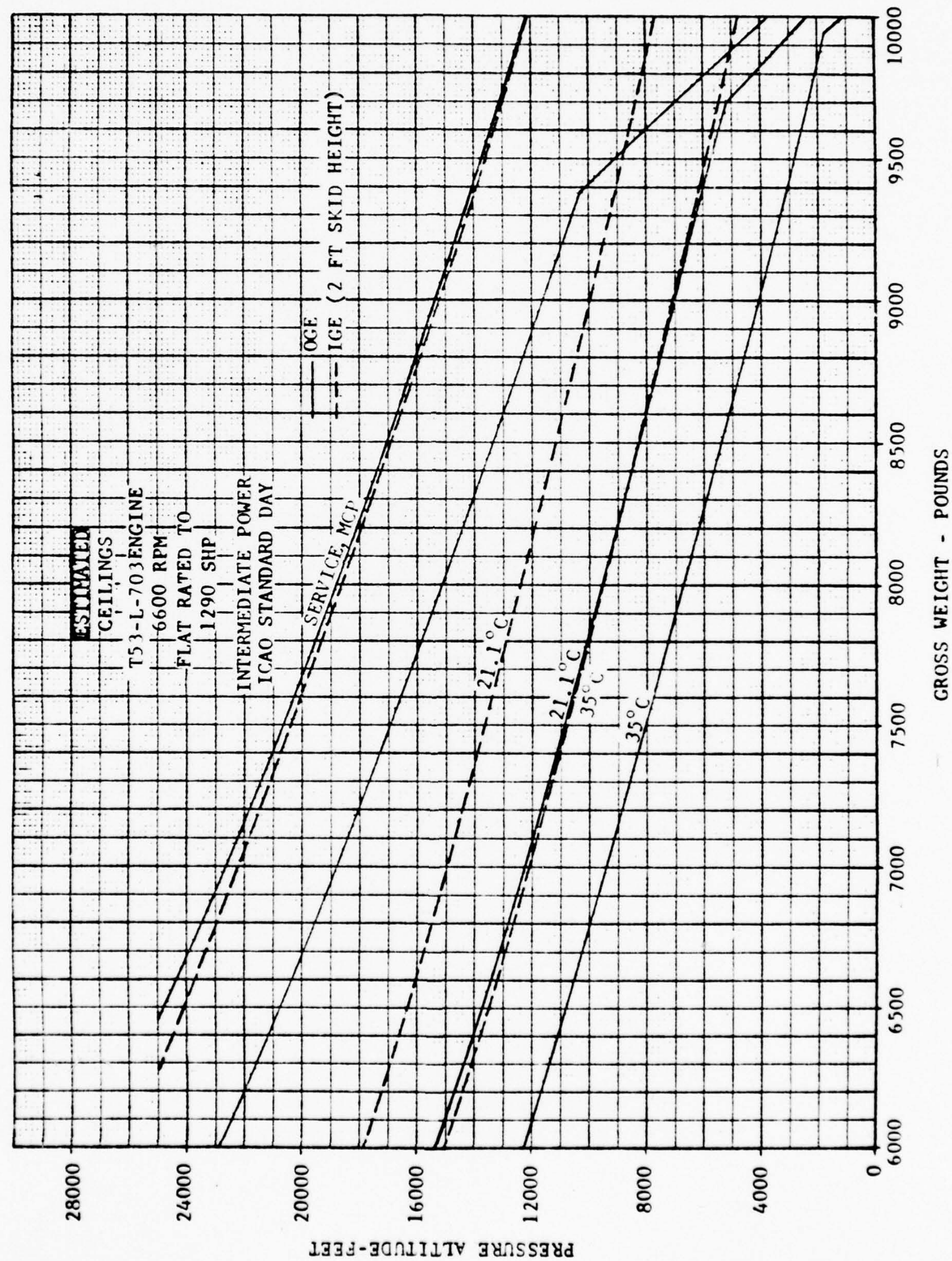


Figure 7 . Ceilings, All Configurations

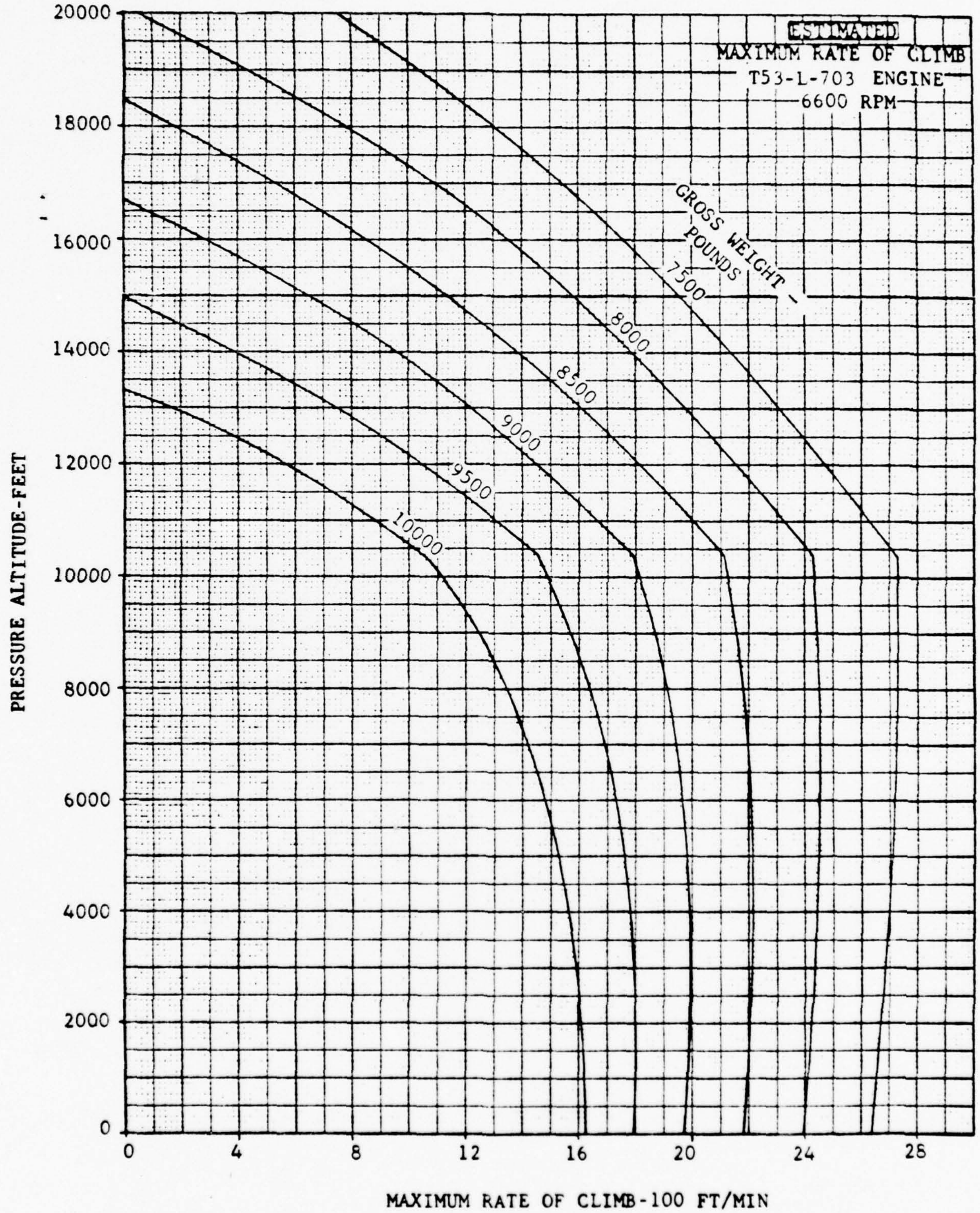


Figure 8. Maximum Rate of Climb at Intermediate Power, Standard Day, All Configurations

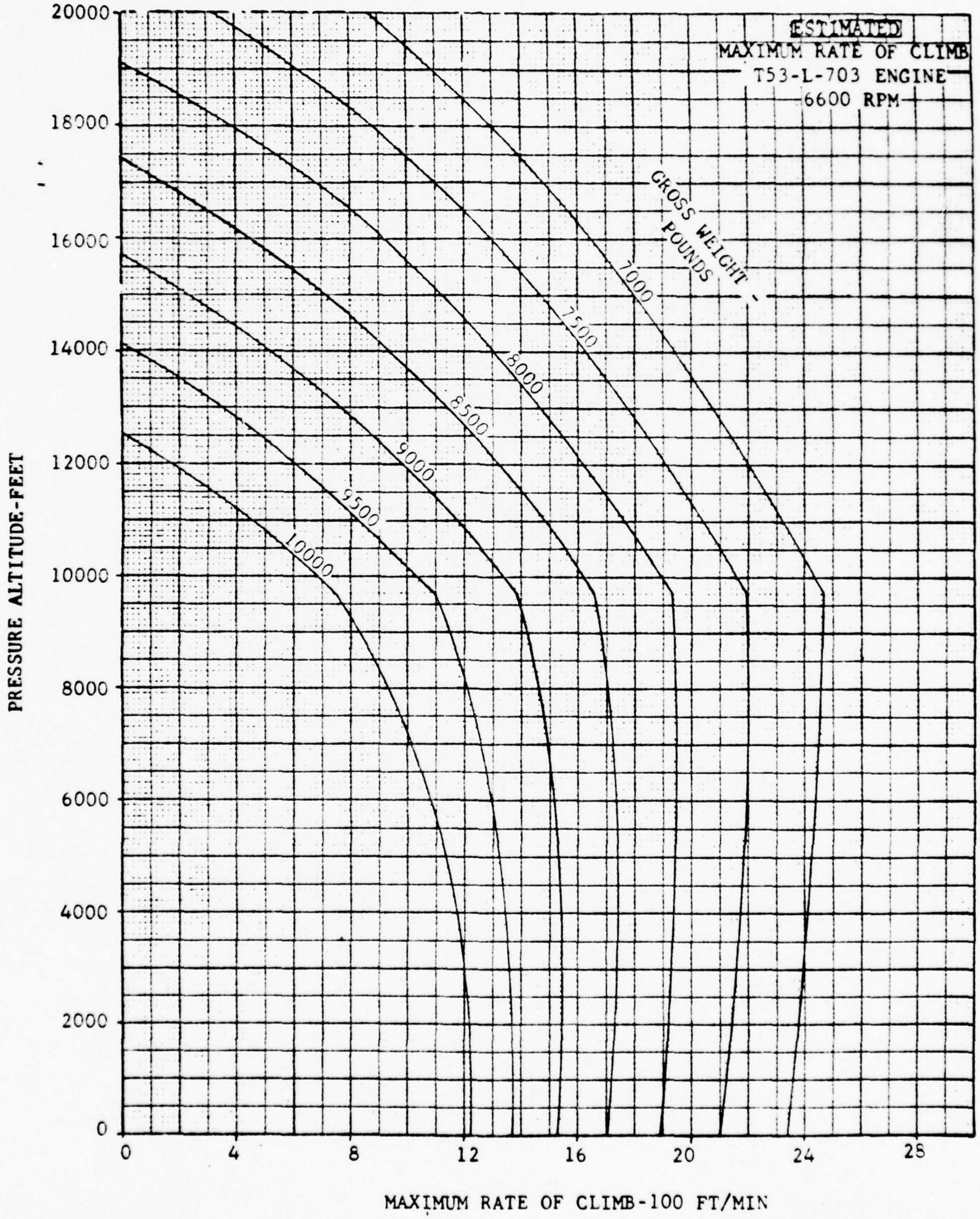


Figure 9 . Maximum Rate of Climb at Maximum Continuous Power, Standard Day All Configurations

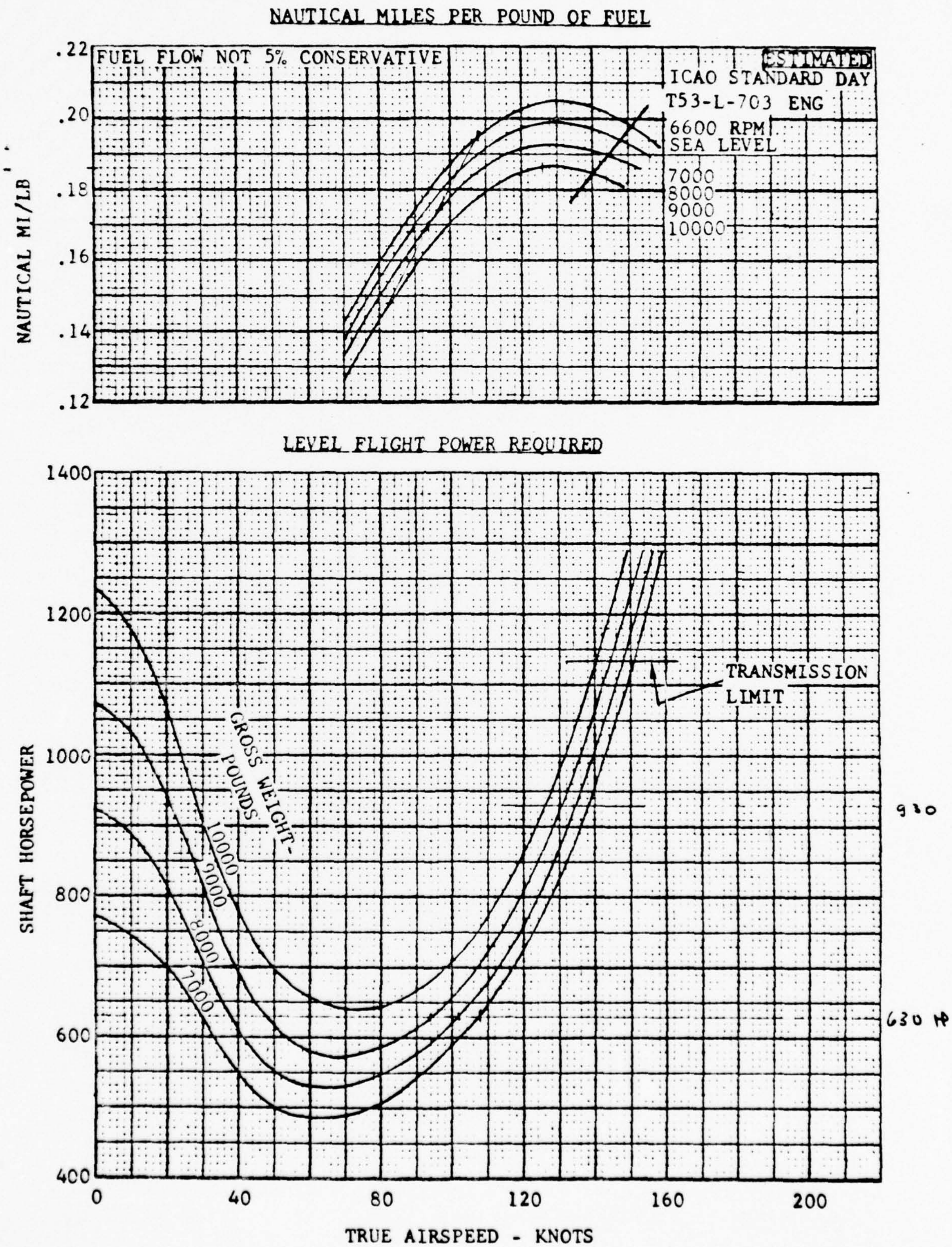


Figure 10. Performance at Sea Level Standard Day, Clean Configuration

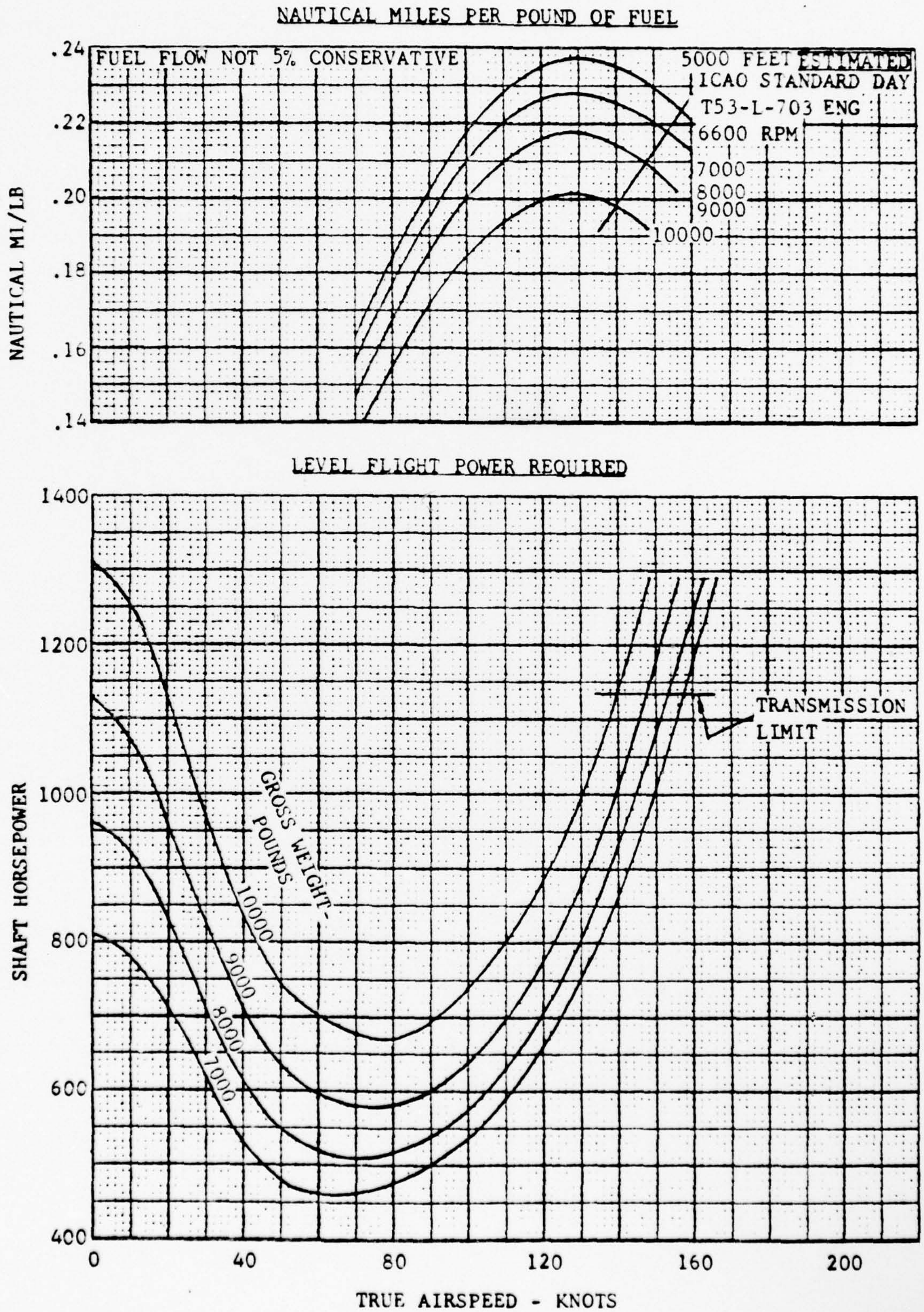


Figure 11. Performance at 5000 Feet Standard Day, Clean Configuration.

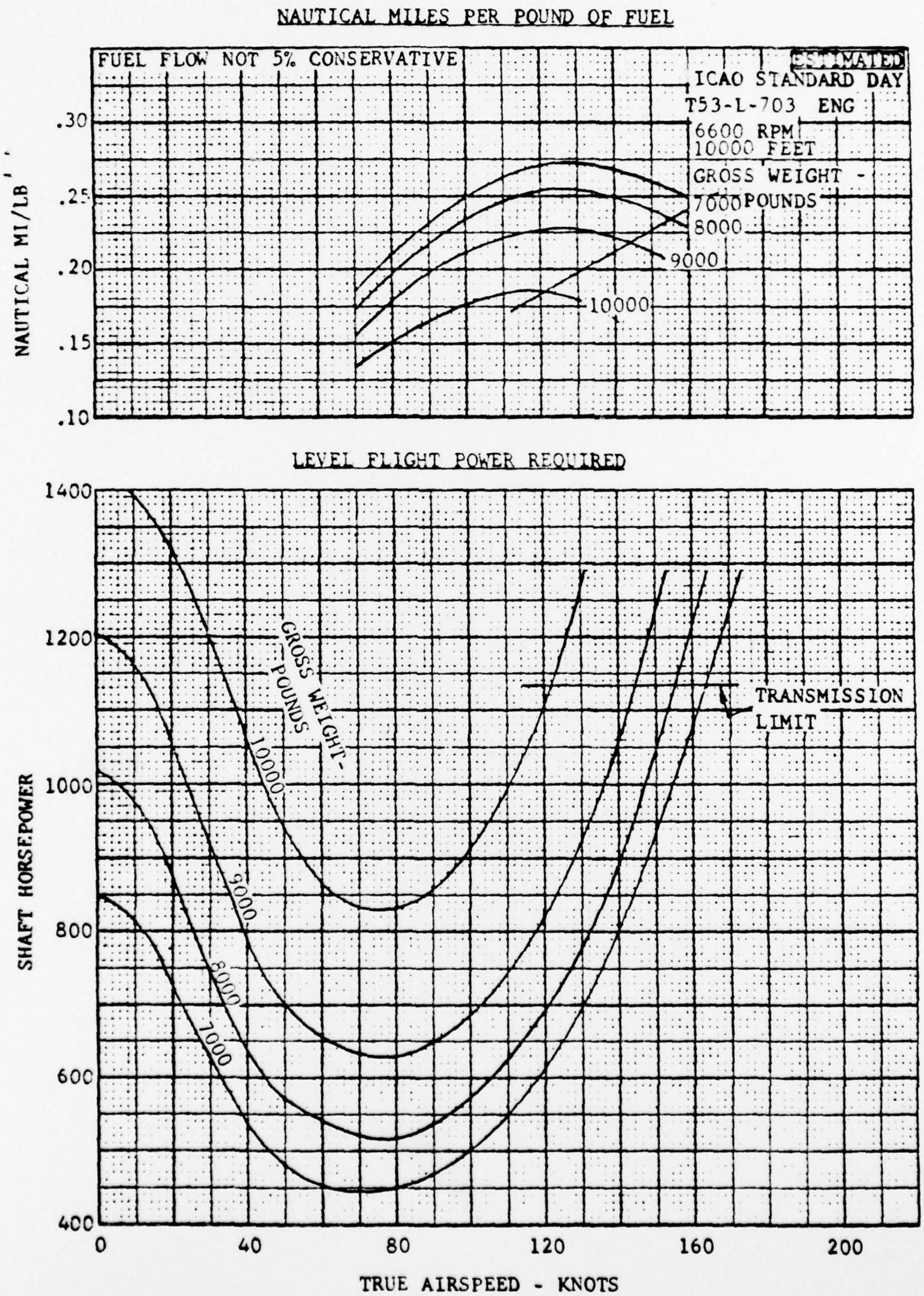


Figure 12. Performance at 10000 Feet Standard Day, Clean Configuration.

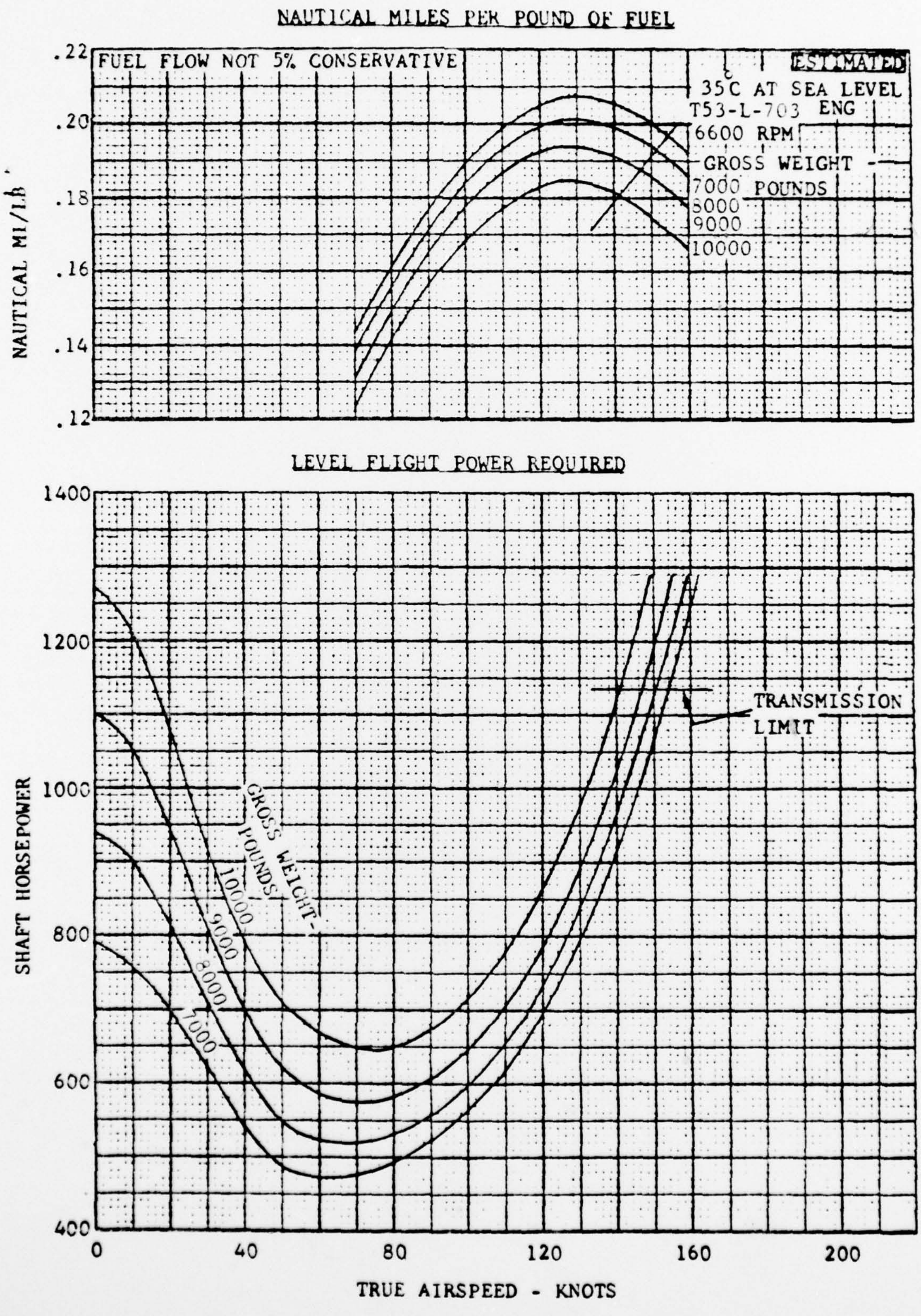
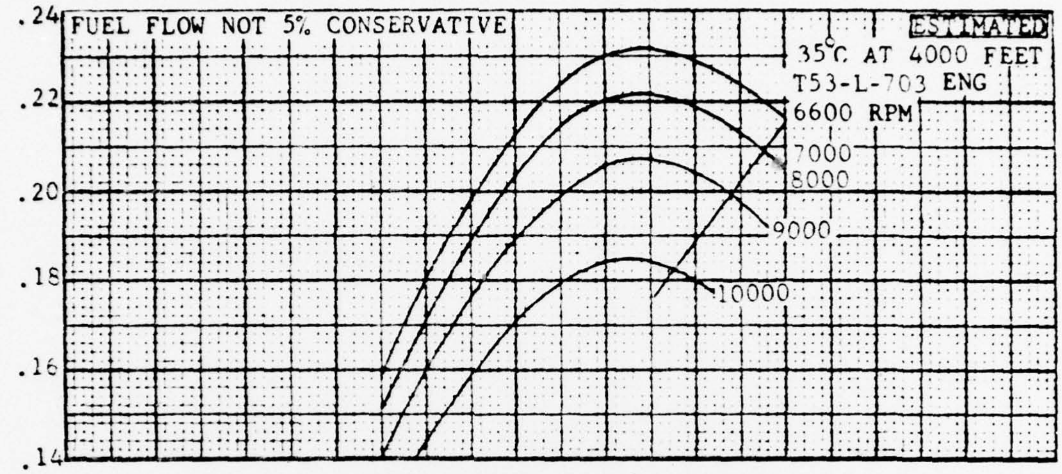


Figure 13. Performance at Sea Level 35° C, Clean Configuration



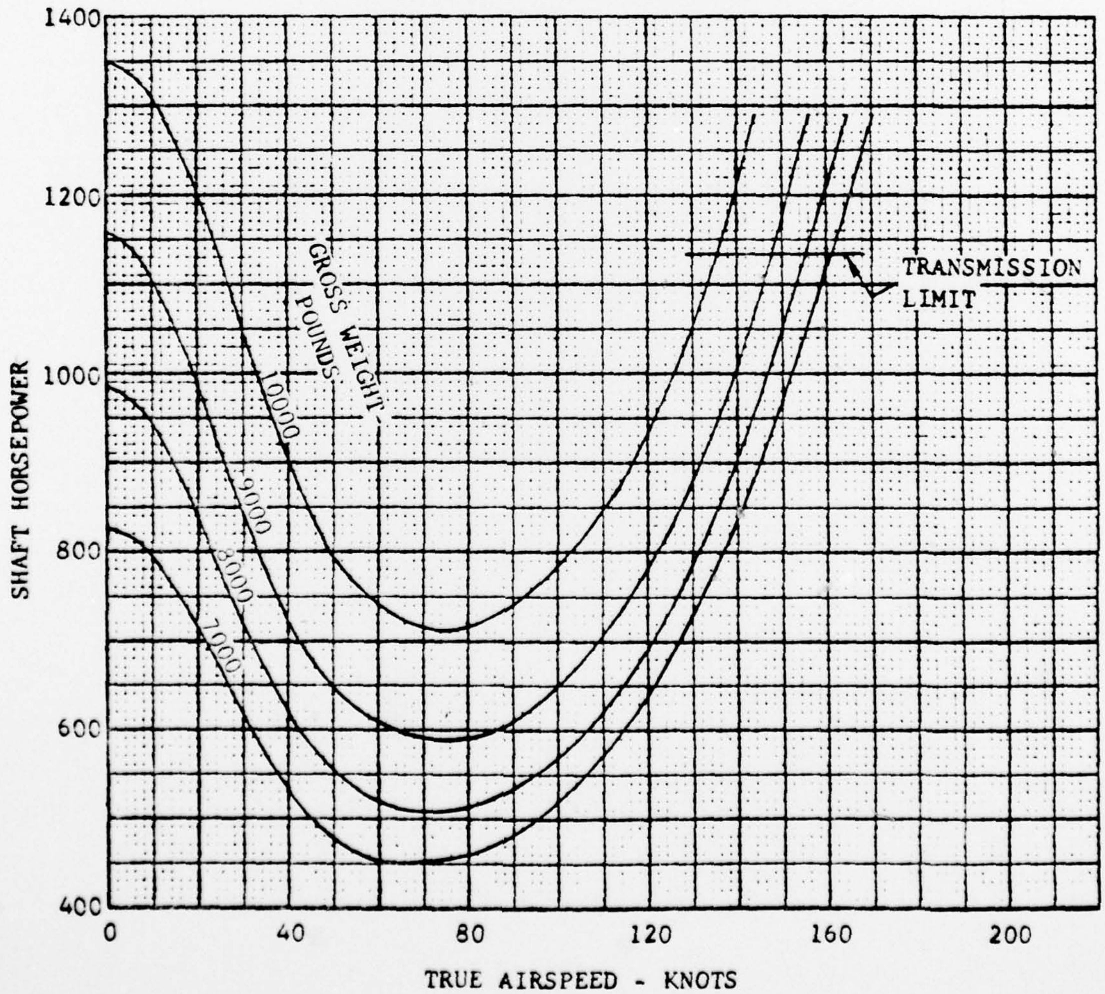


Figure 14. Performance at 4000 Feet 35° C, Clean Configuration.

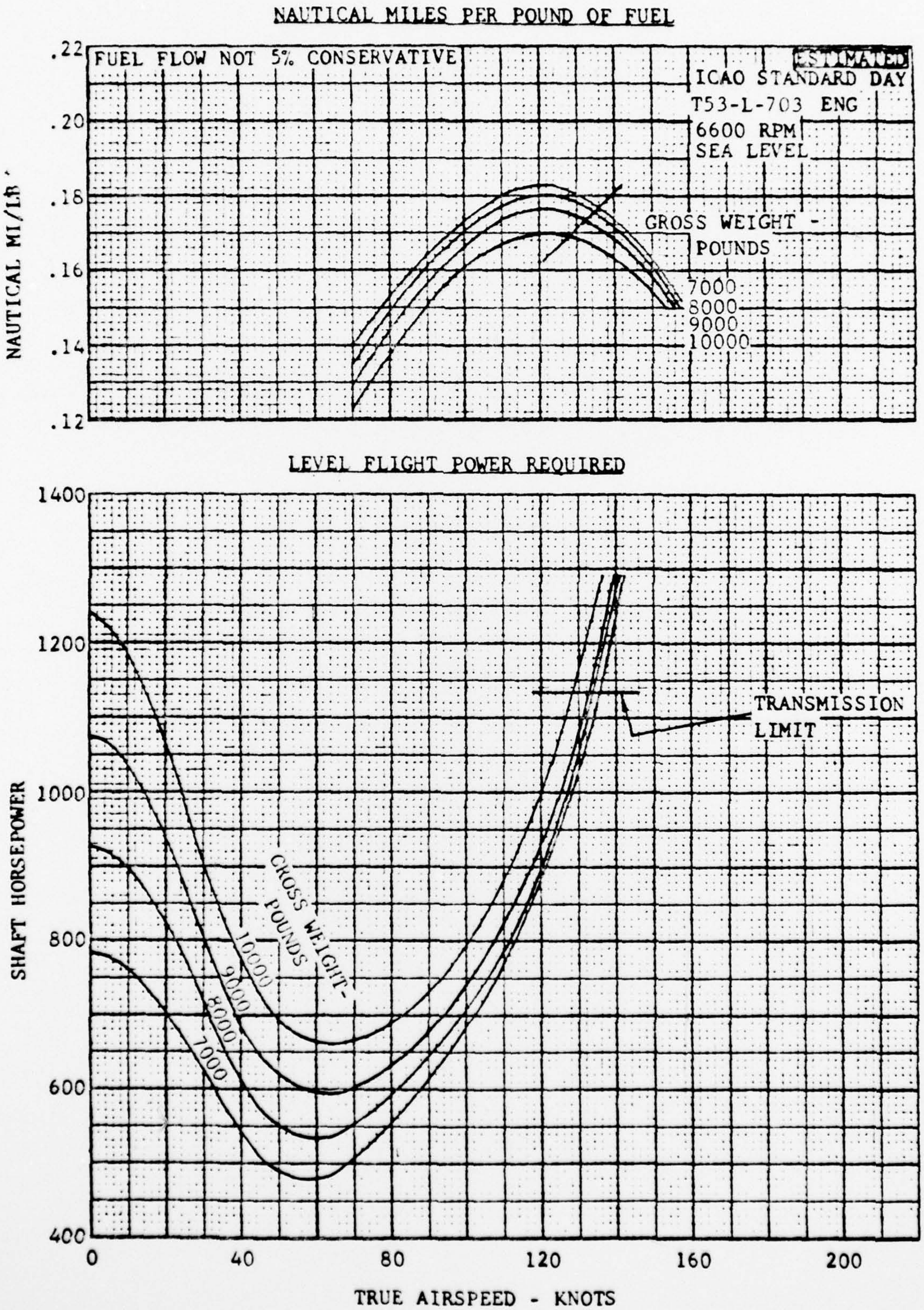


Figure 15. Performance at Sea Level Standard Day, 8 Tow Configuration.

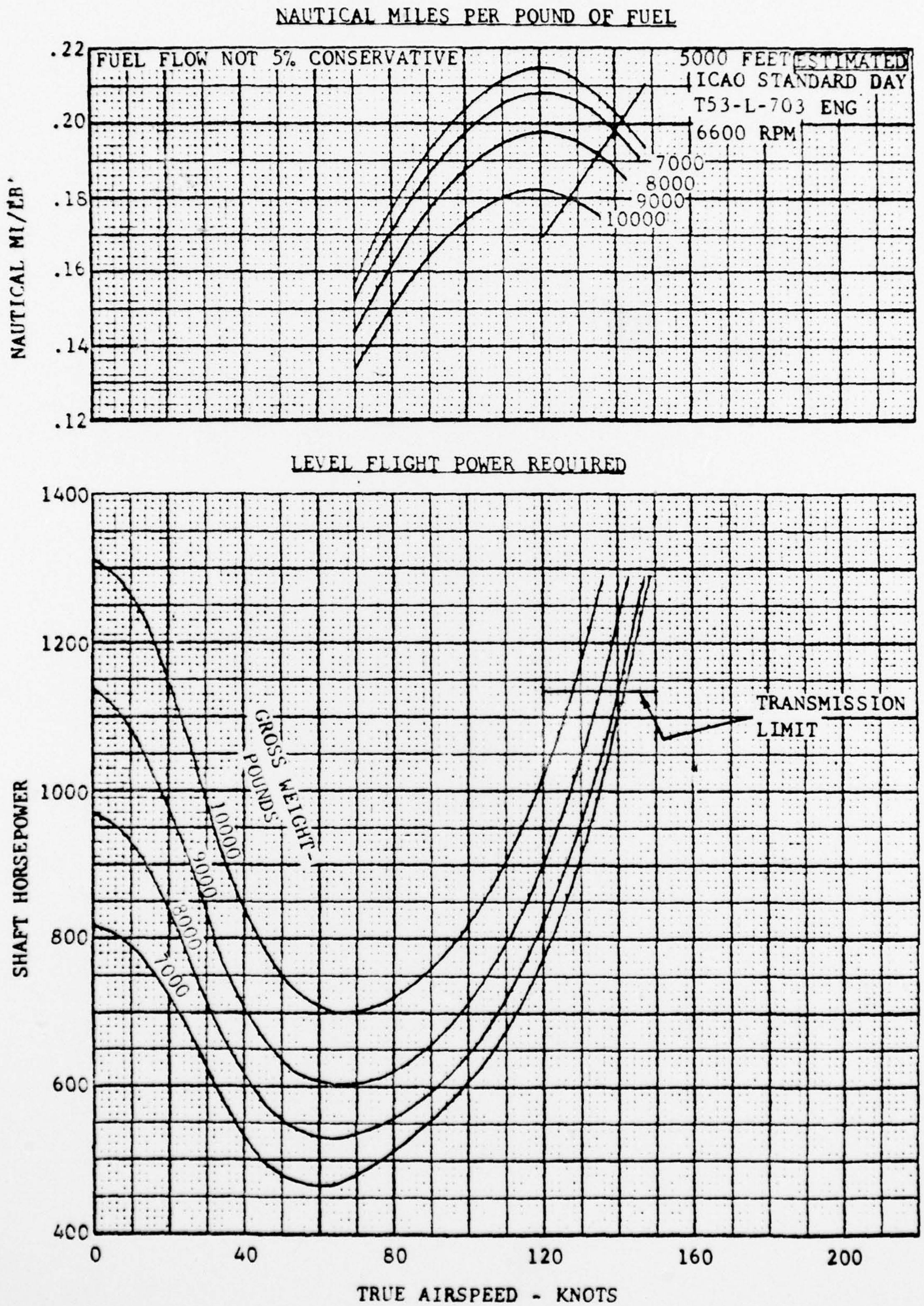
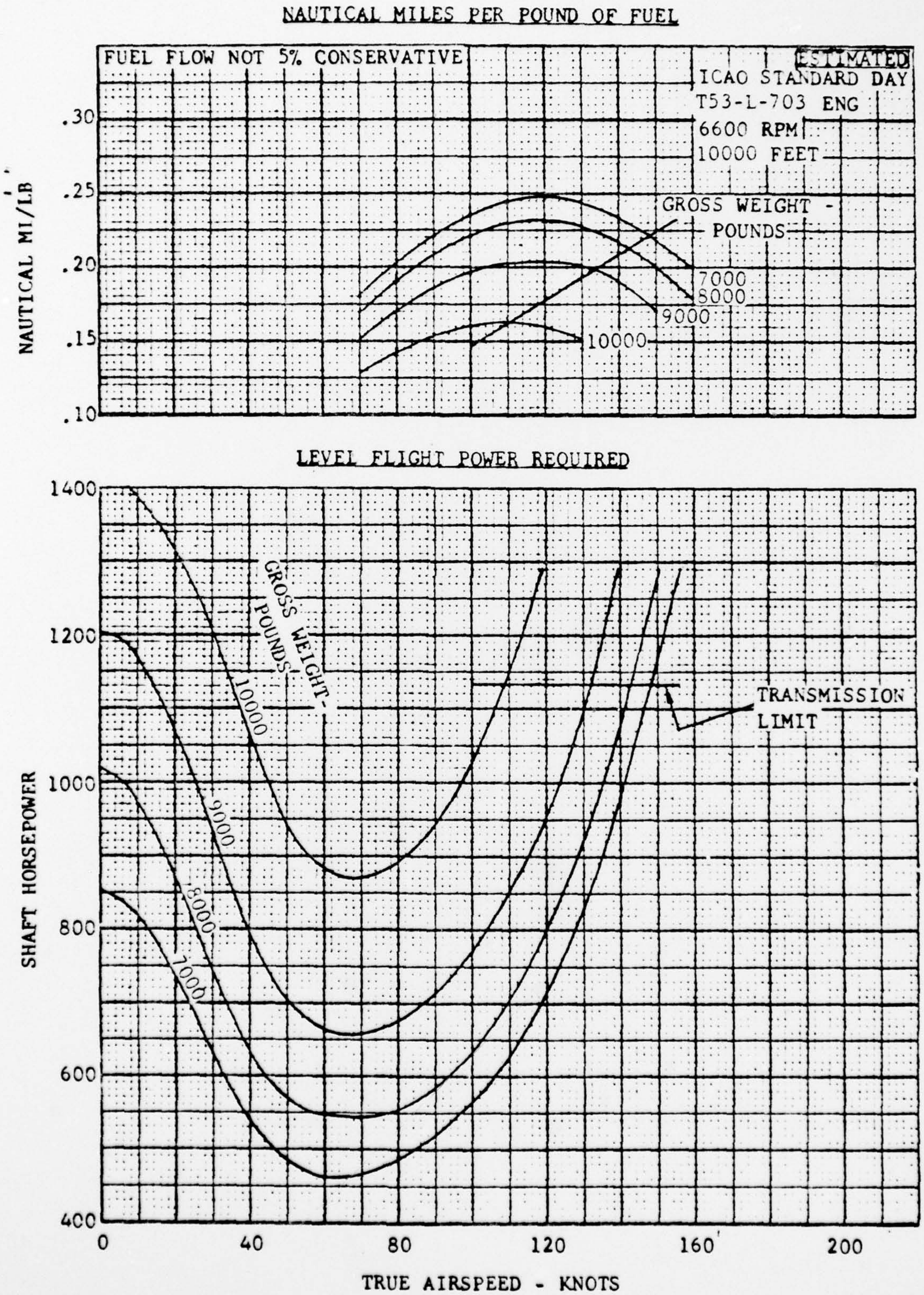
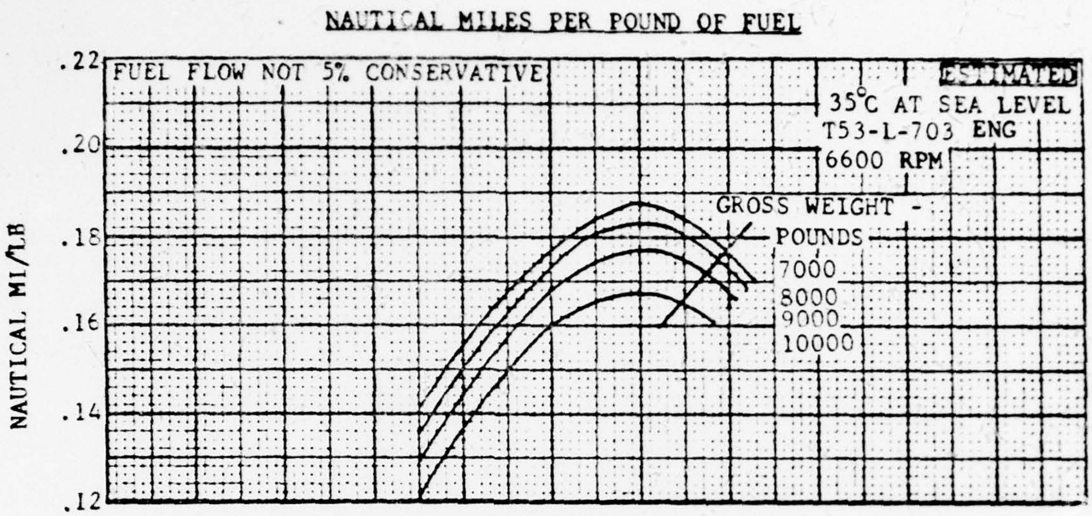


Figure 16. Performance at 5000 Feet Standard Day, 8 Tow Configuration.



Figures 17. Performance at 10000 Feet Standard Day, 8 Tow Configuration.



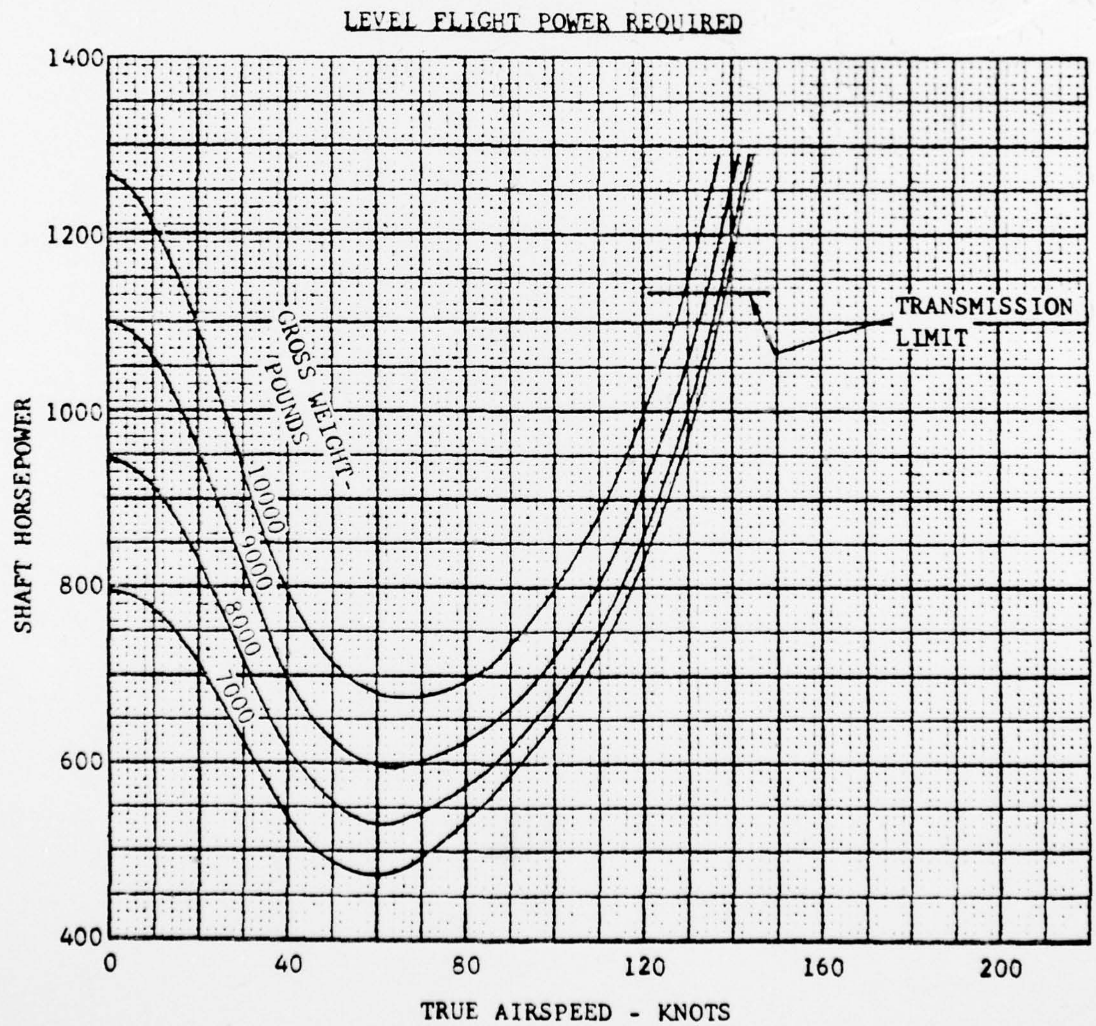
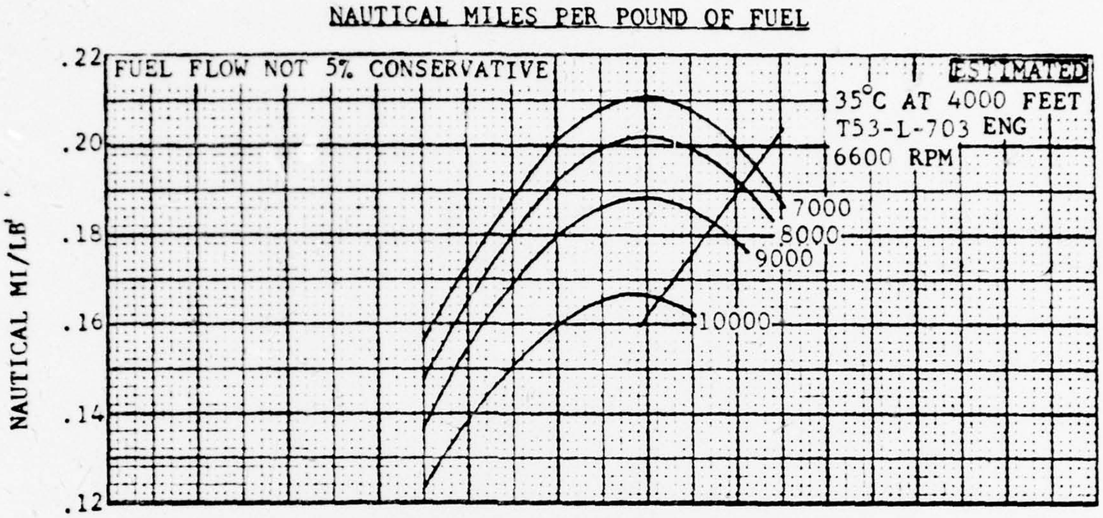


Figure 18. Performance at Sea Level 35° C, 8 Tow Configuration.



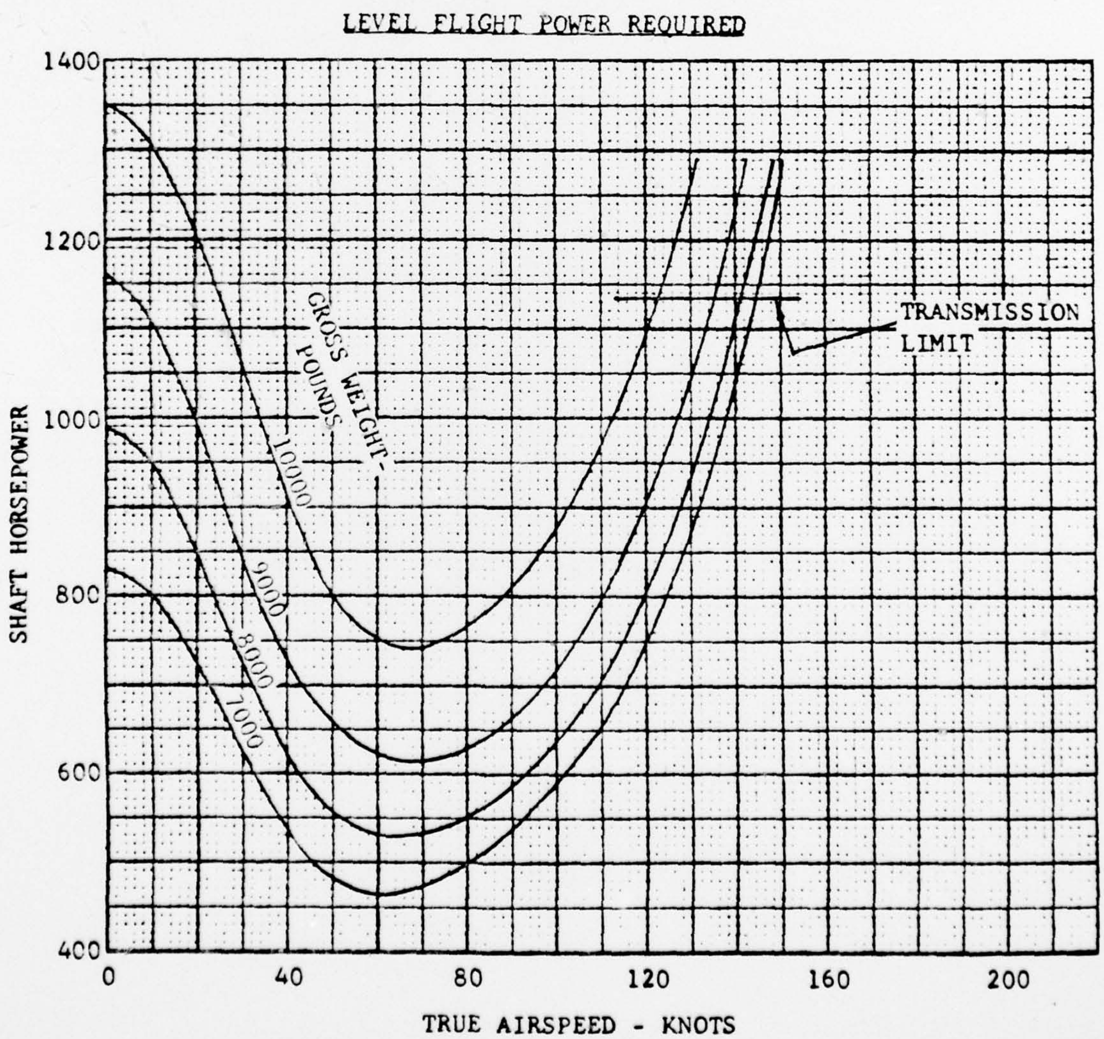


Figure 19. Performance at 4000 Feet 35° C,
8 Tow Configuration.

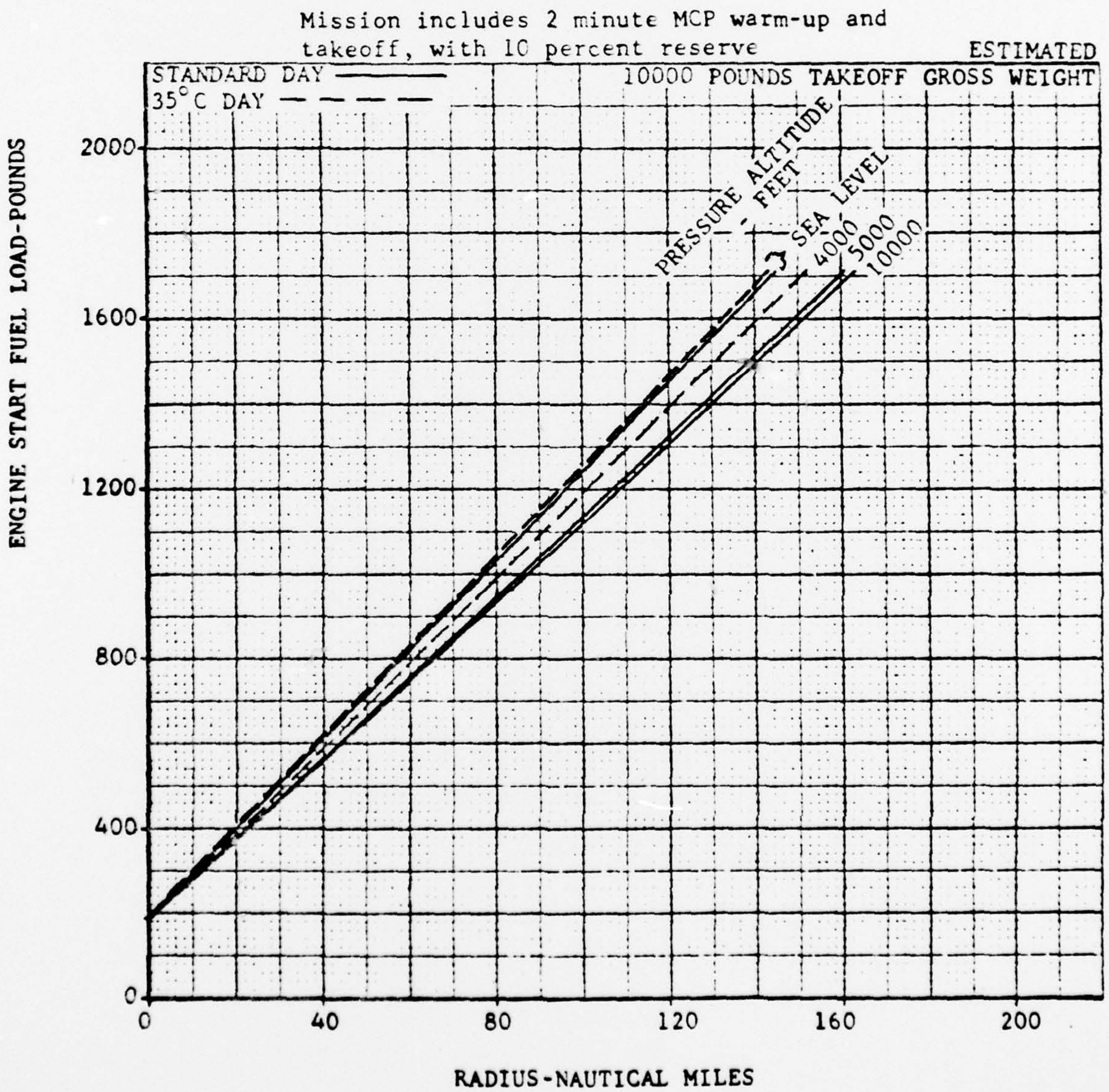


Figure 20. Radius of Action
Clean Configuration

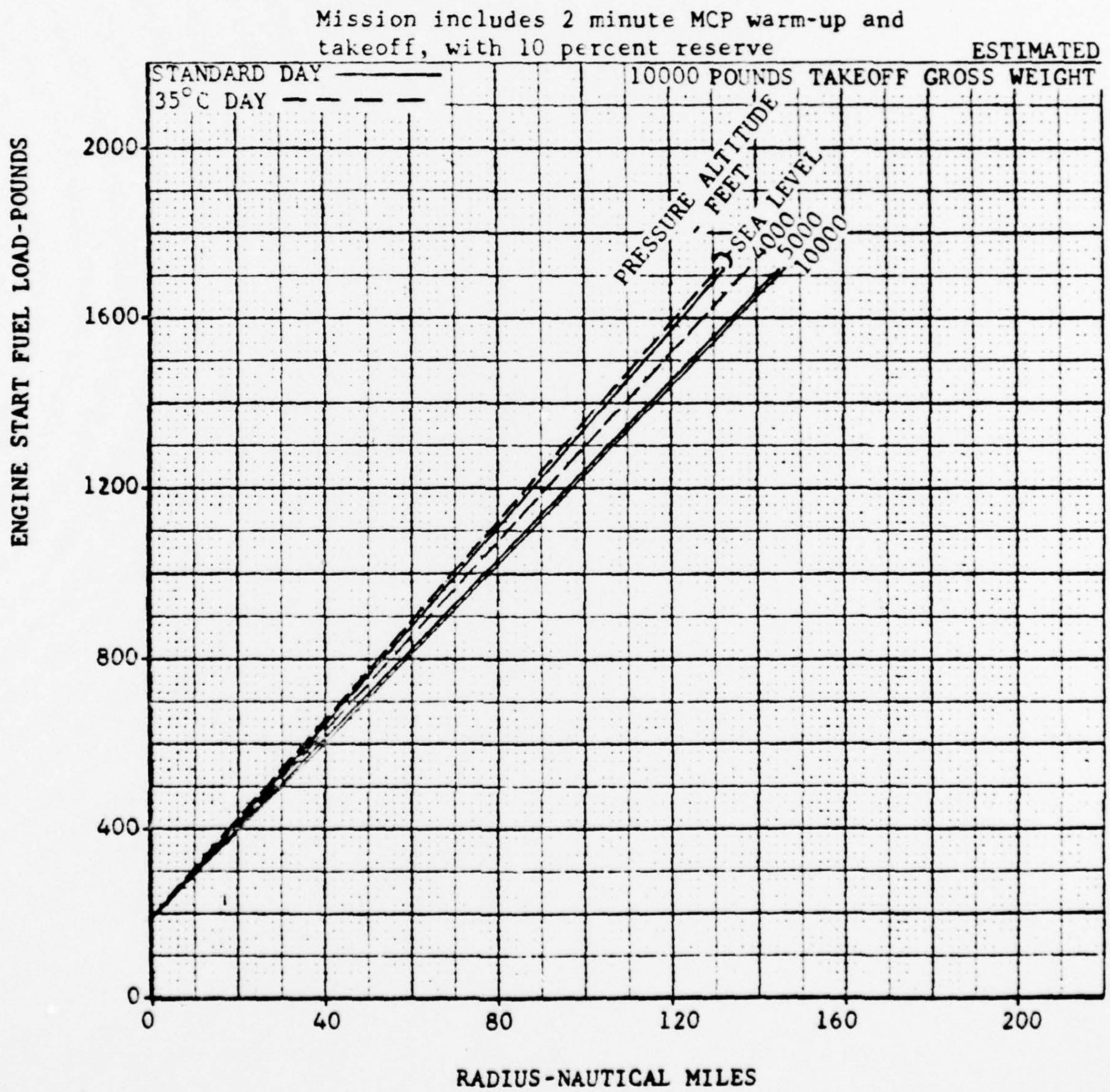


Figure 21. Radius of Action
8 Tow Configuration

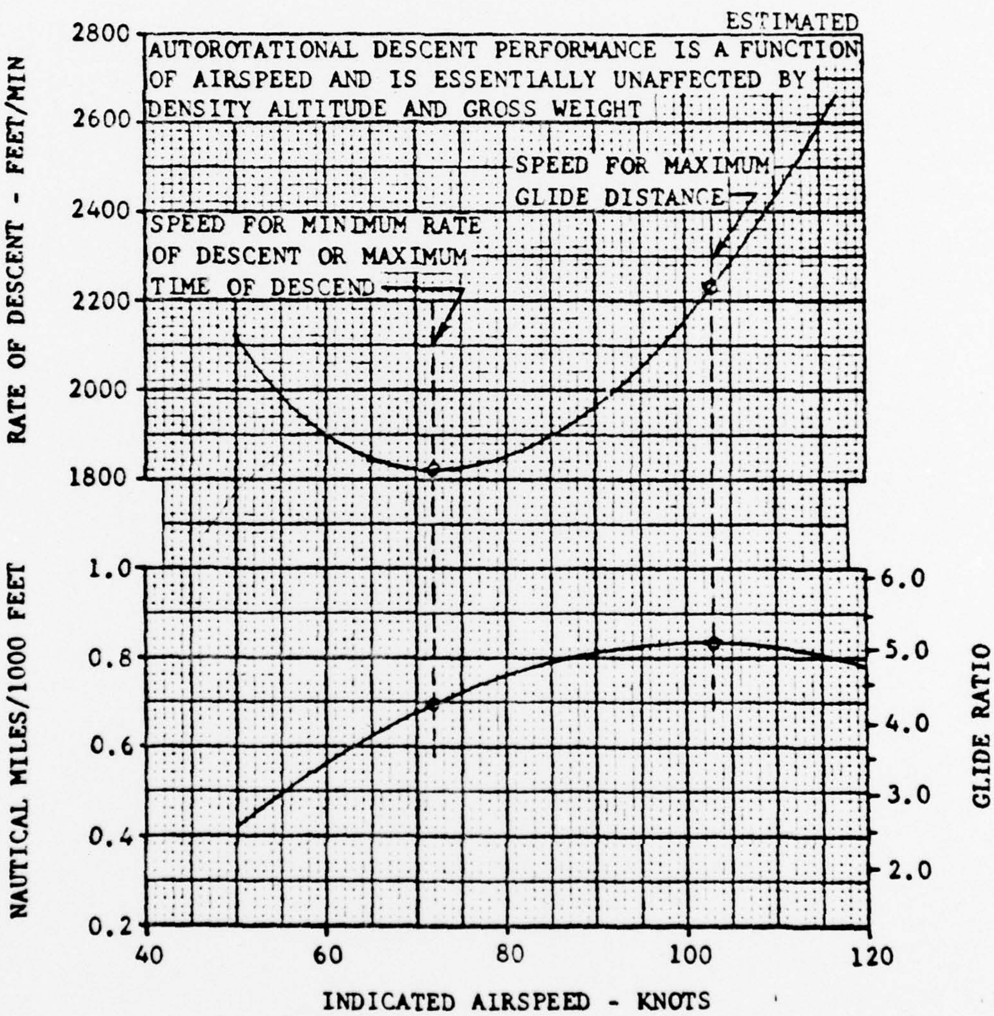


Figure 22. Autorotational Characteristics

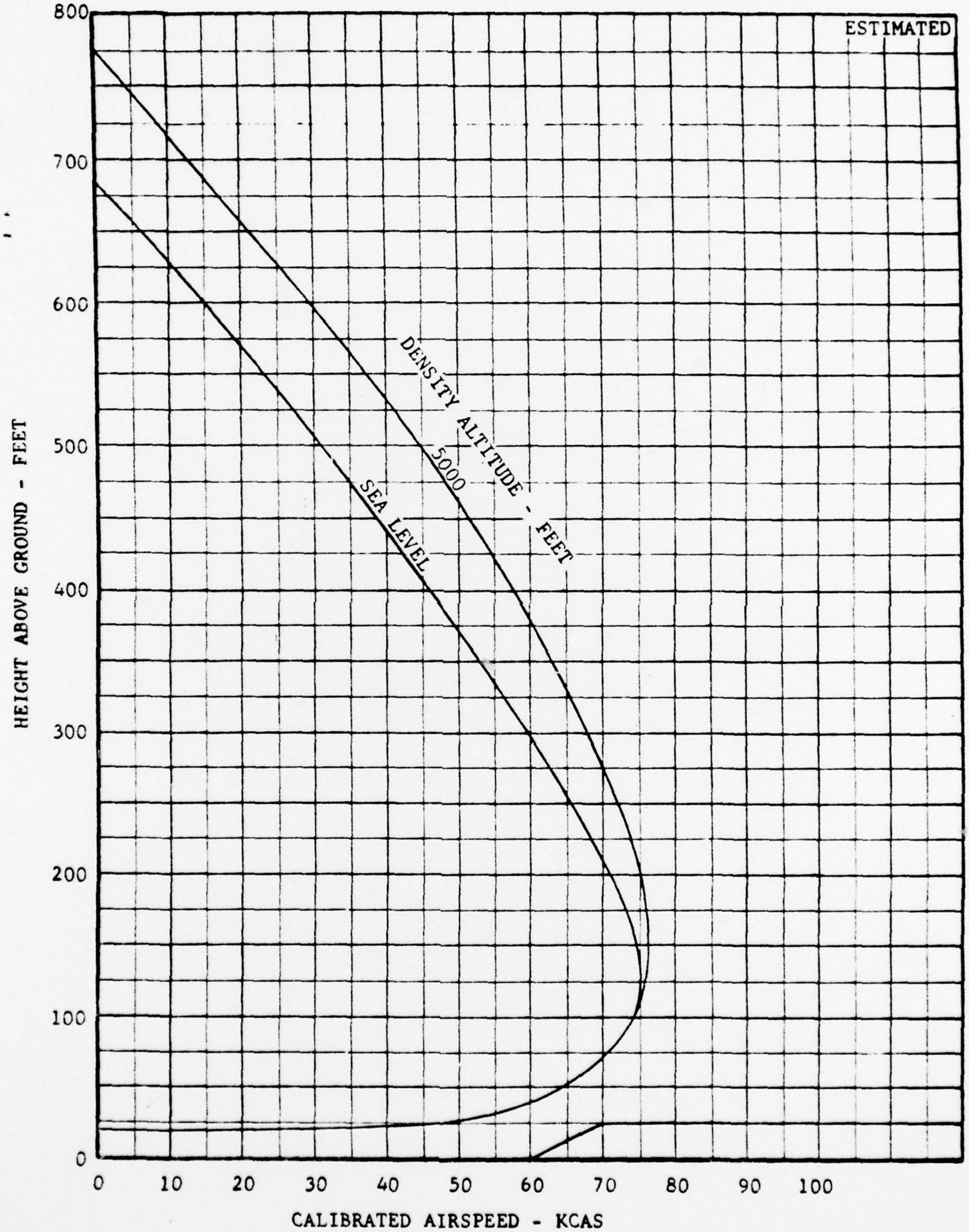


Figure 23. Height - Velocity Diagram

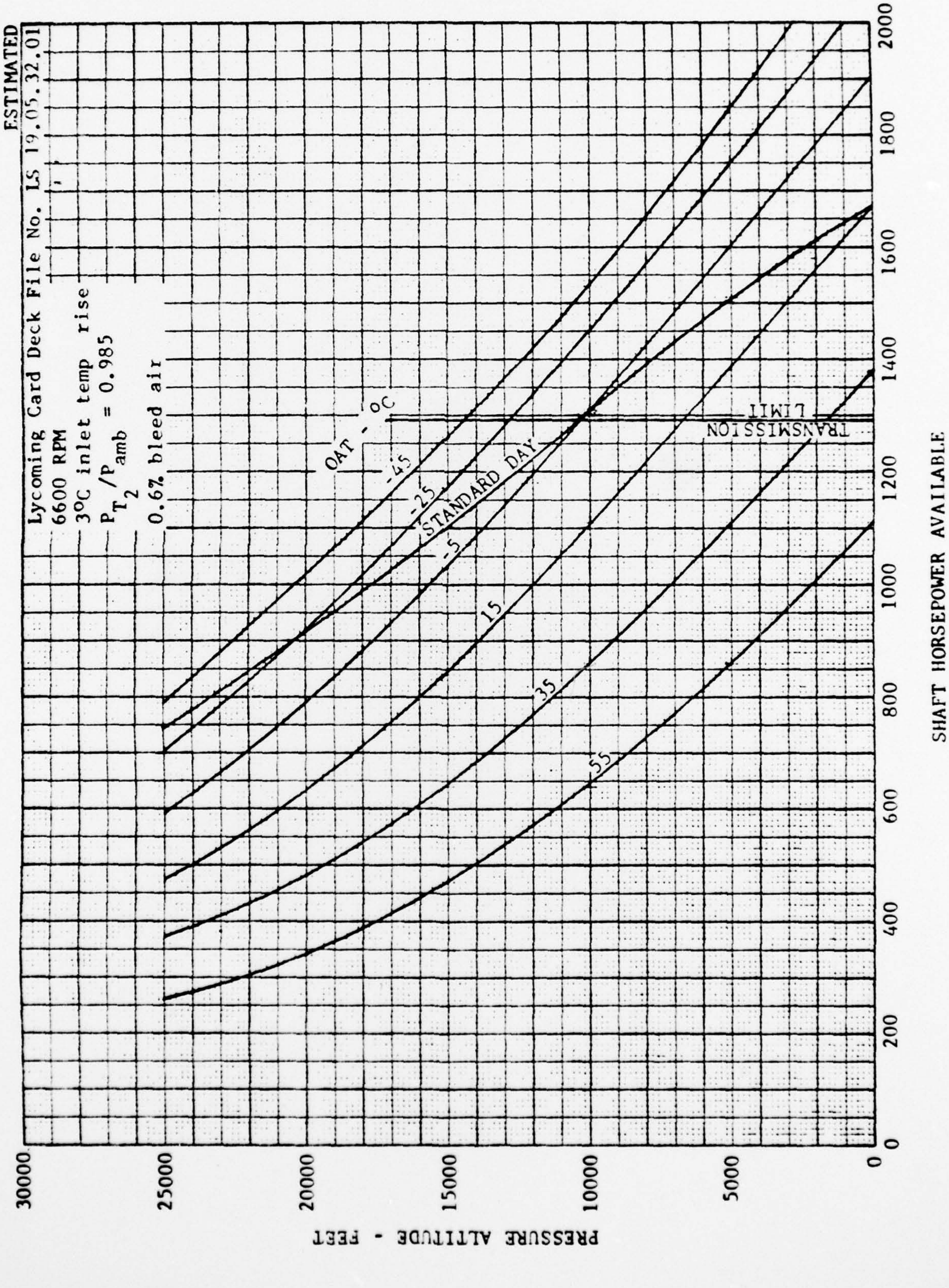


Figure 24. Intermediate Power Available

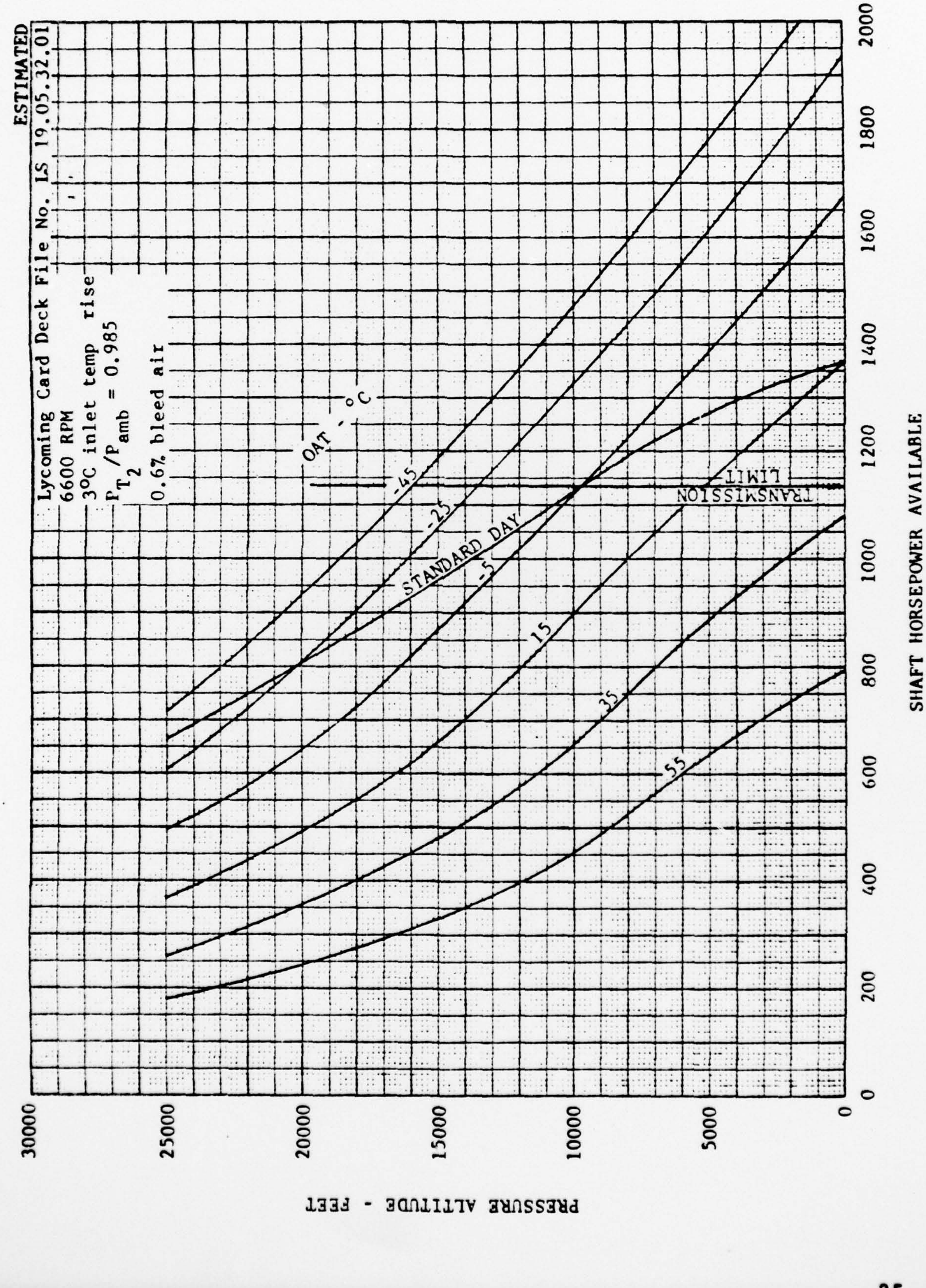


Figure 25. Maximum Continous Power Available